

COMPUTER DECISIONS[®]

JANUARY 15, 1985

THE MANAGEMENT MAGAZINE OF COMPUTING

A HAYDEN PUBLICATION

AT&T a year later

Expert systems

Bolstering
corporate micros

OA survivors

Preparing for
the next slowdown



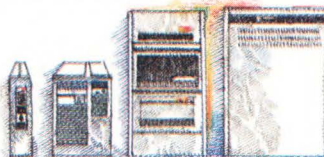
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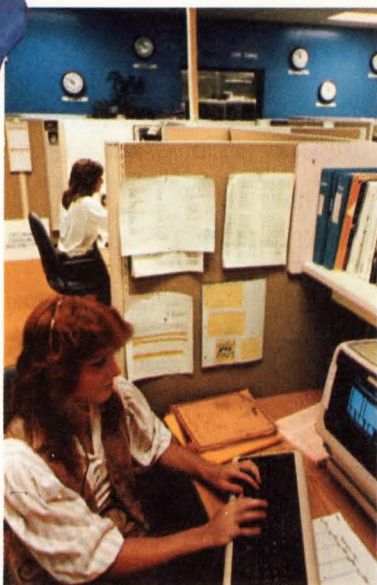




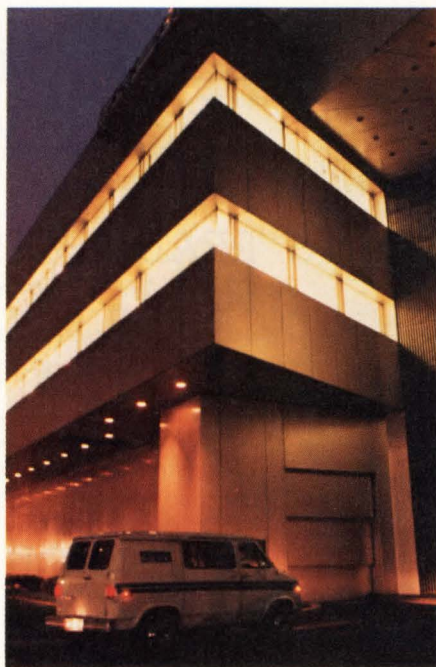
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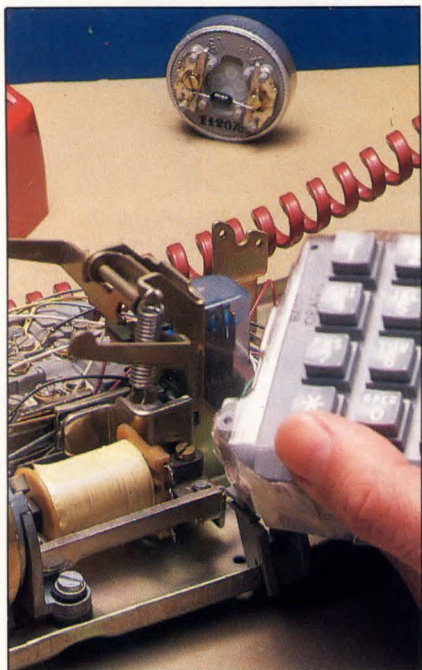
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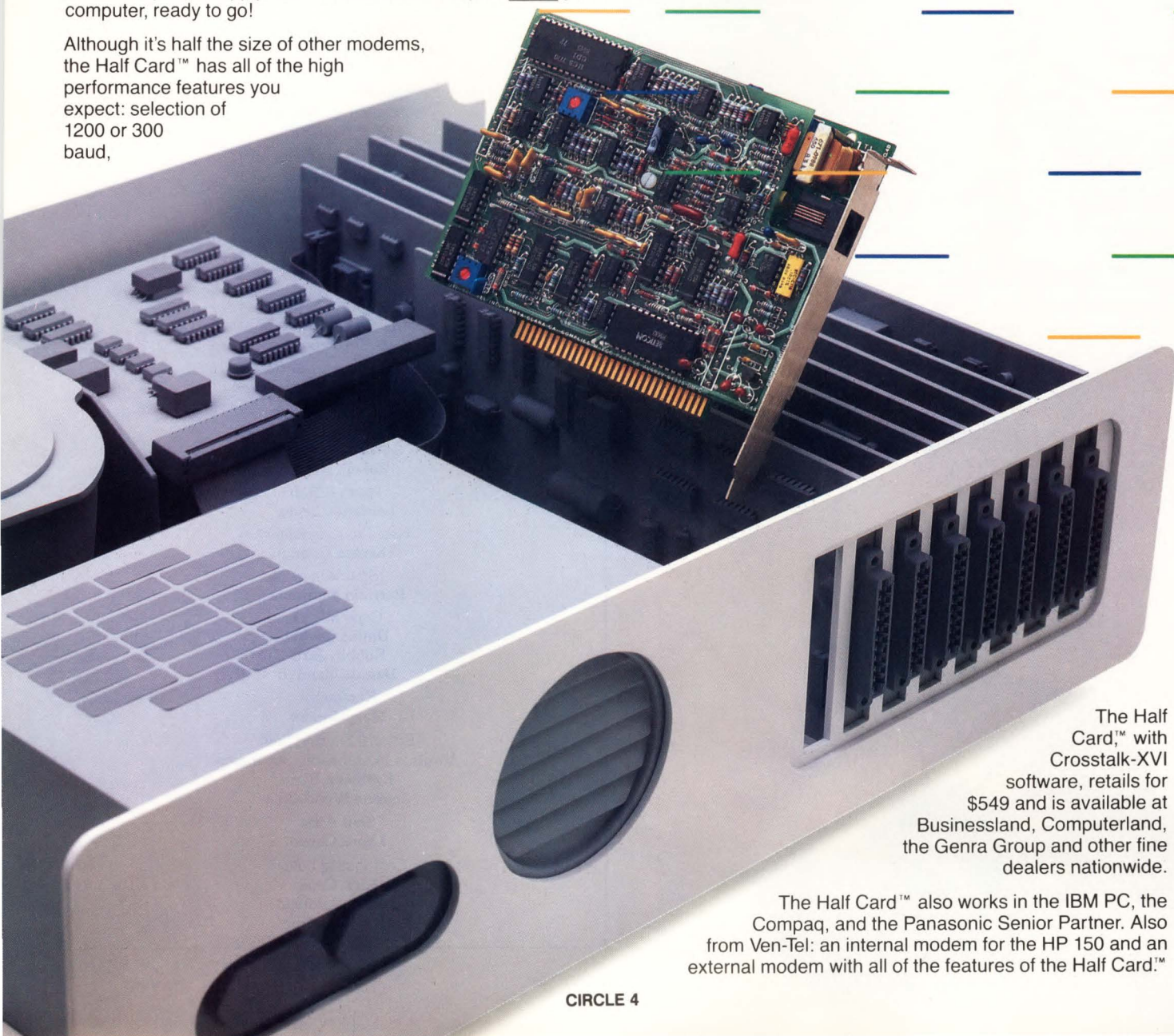
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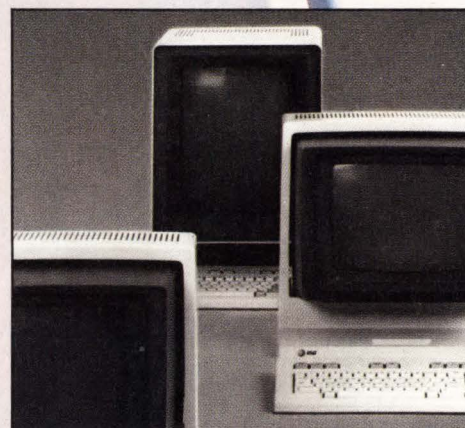
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by Mel Mandell

HOT OFF THE PRESSES

Your next issue of *Computer Decisions* is only two weeks away. January 15th begins a new era for *Computer Decisions*. On January 15th, *Computer Decisions* became a biweekly magazine. Thumbing through the pages of this issue, you'll find the same columns, departments, and feature articles that we've brought you for the last six years. Although the lineup hasn't changed much, the information we publish will be fresher and more timely than ever.

In more than doubling our regular frequency, we haven't tampered with our solid lineup of features and columns. Each issue will start with Insight, *Computer Decisions'* editorial page. Next comes an expanded News & Comment section. Our columns, Personal Computing, Strictly Software, Data Communications, and Following the Leaders, come next. Training, a popular column started last year, and Office Automation will alternate issues in the next slot.

The middle of each issue will contain feature articles on a broad range of subjects. The responsibilities of information managers in many corporations are changing and expand-

ing, and we've expanded our coverage to keep up with all of the information-handling issues and decisions you face in the office, the executive suite, the factory floor, the mass-merchandising outlet, and so on. In every issue, you'll find feature articles on the latest in management issues and strategies, software and hardware, personal computing and office automation, and data- and telecommunications. On occasion, you'll find Outstanding Data Centers,

our photographic tours of notable facilities, application stories, and special short reports. Each issue will wrap up with an expanded New Products section, a Letters section that allows you to voice your concerns, and the popular Your Career column.

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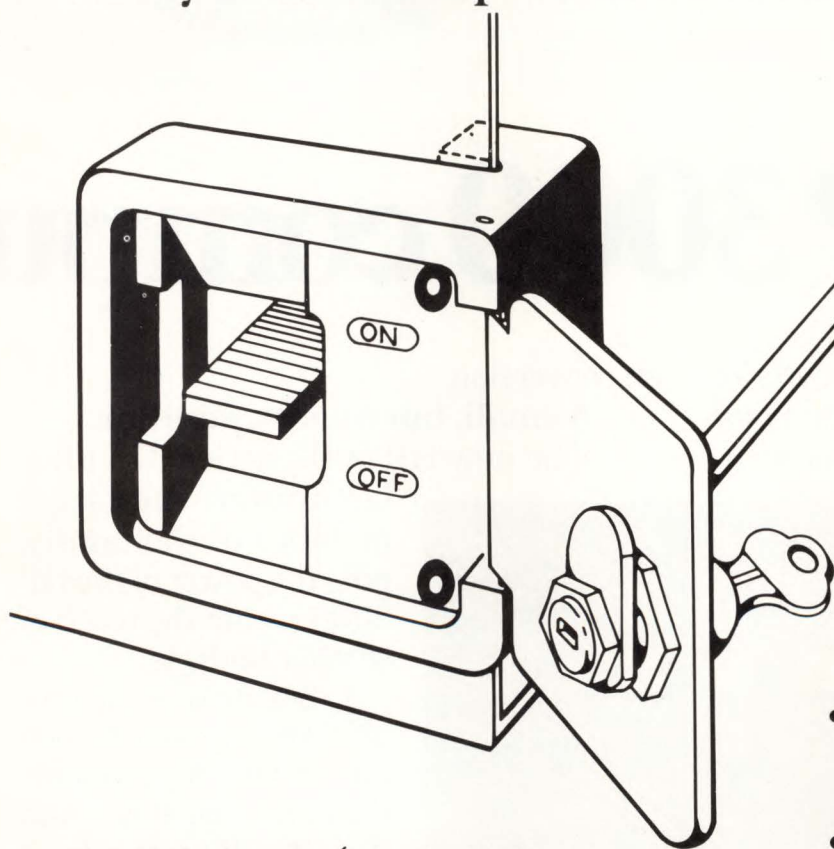


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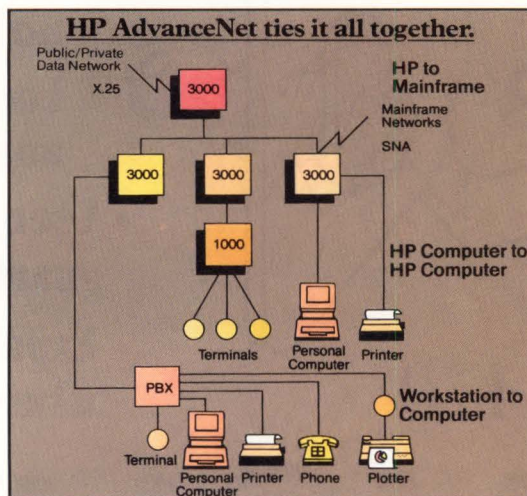
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NEWS & COMMENT

Edited by Joseph Braue, News Editor

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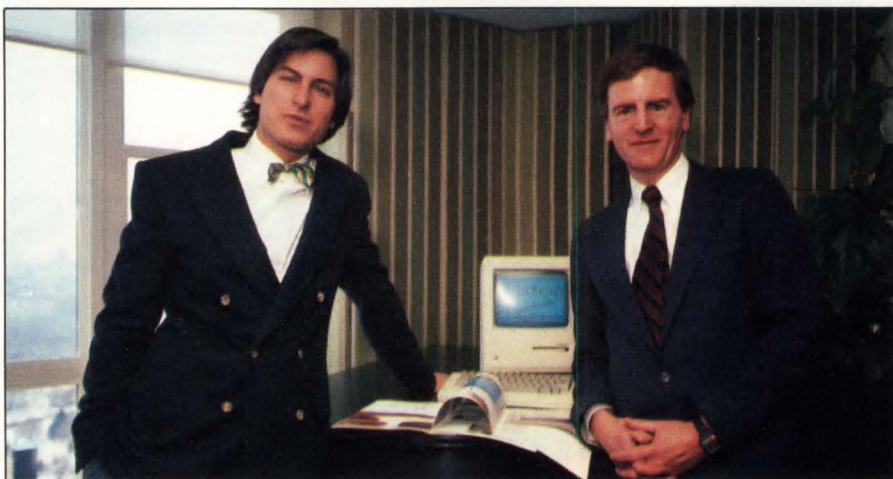


Photo by Mario Ruiz/Picture Group

Apple's Steven Jobs and John Sculley are targeting the Macintosh to new corporate users.

Maybe in about a year. By that time, perhaps Apple Computer Inc. will offer a way to hook its easy-to-use Macintosh personal computer into IBM networks and mainframe office software. Users relying on Macs will then be able to access, edit, and send documents to other workers whose documents are tied up mostly in IBM hosts.

Maybe by that time the multitudes of white-collar workers in corporate America who are not using personal computers will be breaking down MIS/dp executives' doors, convinced that they need a micro after taking a test ride on a Mac. Maybe by that time Apple Computer, Inc. will have a way to hook the easy-to-use Macintosh into an IBM network so that documents created in the IBM world can be used by Macs, and vice versa.

However, maybe by that time, experts predict that either IBM or some third-party software or hardware outfit will have discovered how to give the IBM Personal Computer series the same easy-to-use functions that are the Mac's biggest selling points today.

When MIS/dp executives and analysts were asked if the Mac has anything significant to offer the dp establishment, the usual answer was, "Not now—maybe later."

A typical response was from a senior MIS executive from a large midwestern retailer. His company has many IBM mainframes. It originally bought Apple IIs and was considering the Mac but decided not to buy. "The Macintosh is a very good stand-alone device for untrained professional users," said the executive, who requested anonymity.

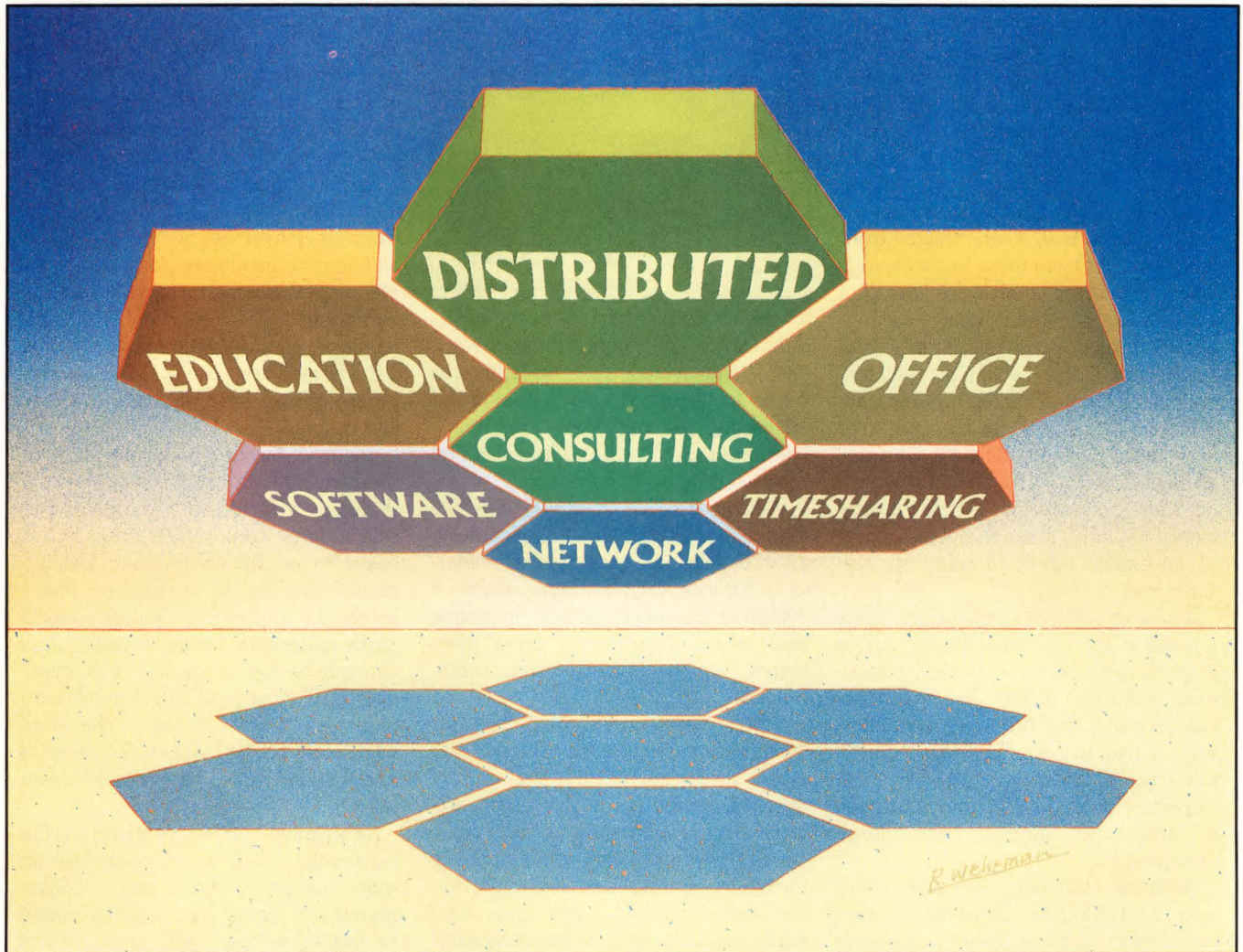
At this executive's employer, the ad-

vertising department loved using the Mac to make graphs and lay out pages. Several engineers who had never used computers started to store lists and create small schedules with Macs. Other companies use them to spread the seeds of computer expertise throughout the corporation. Massachusetts Mutual Life gives them to executives expressly for this reason, says Jack Laflamme, a systems planner with Massachusetts Mutual.

But when users have to connect with IBM networks, obstacles arise, many say. "There are big problems integrating Macs into (IBM) networks, and this will limit them to stand-alone use," says the MIS executive from the retailer.

The Macintosh can access IBM mainframes by imitating an IBM terminal. But this executive and others deplore its inability to connect to IBM

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NEWS & COMMENT

mainframe office systems such as Distributed Office Support System (DISOSS). It's desirable to send and receive data from an IBM mainframe, but Mac users will also need access to the documents and files on IBM hosts, and to be able to edit and store them on the micro and send them back to the hosts.

In fairness, few, if any, micros from other vendors have these features, says David Terrie, an analyst for the Yankee Group, a Boston-based research firm. But major vendors such as Digital Equipment Corp. (which recently announced a link to DISOSS), Wang Laboratories Inc., and Data General have announced plans to add these features, he says. John F. Rizzo, Macintosh product manager, says that if organizations want DISOSS, "it would not be unusual" to expect Apple to come up with some sort of bridge.

However, Apple's networking plans are still in the formative stages. Apple is expected to soon announce a local-area network (LAN) for the Mac. Rumor has it that Apple will also introduce a way to hook IBM PCs into the network. All this may be useful to small departments and businesses, but does it apply to medium and large companies?

Michael Hammer, who runs Hammer and Co., a Cambridge, MA, consultancy, says no. Hammer believes vendors must offer departmental solutions, a step up from a simple personal-computer LAN. Corporations need minicomputers as file-sharing devices for personal-computer users and as repositories for special software that helps departments do specialized jobs such as marketing, accounting, or purchasing. Despite the rumors about agreements with Wang, a strong supplier of minicomputer-based office automation systems, Apple still does not



The Mac: Nobody said it wasn't easy to use.

offer customers a mini, Hammer says, and Wang doesn't seem receptive to the idea. "Apple is busy following the philosophy of personal computing," Hammer says. "It is being driven not by reality but by wishful thinking."

At Comdex Fall in Las Vegas, Apple President and CEO John Sculley delivered his own "I've got a dream" scenario for his company. Sculley described a "vision of bringing computers to people who never dreamed of using them before . . . one person . . . one computer."

Apple believes the Mac isn't for "computer experts" who, according to Apple's estimation, are the current users of computers in major corporations. Sculley asked the Comdex audience, "Is a future that is restricted to further integrating computer experts to the well-established mainframe world really visionary and exciting enough?" It's apparently exciting enough for data-processing executives, who say a major job of theirs is just that. If MIS/dp has its collective hands full with 18-month backlogs and coping with end-user computing, why should it care about Apple's missionary zeal to convert white-collar workers who are not part of the end-user community yet?

A common rap against the Mac has been its lack of business software, but more is on the way. For example,

Microsoft Corp. (Bellevue, WA), which already has a version of the Multiplan spreadsheet for the Mac, has announced word-processing, data-management, and other packages that are or will soon be available.

In the biggest software announcement this year, Lotus Development Corp. in November announced Jazz, an integrated software package for the Mac with the same functions as Lotus' Symphony, which runs on IBM PCs. Apple executives say that as Lotus 1-2-3 helped bring the IBM PC into corporate offices, Jazz will bring the Mac into business.

Richard Strauss, vice president of products for Corporate Software Inc., a Waltham, MA, software distributor that sells to large corporations, says Jazz is easier to use than Symphony. Using a mouse to point to an icon on Mac's screen that represents a function seems much easier than keying in codes. Jazz can only be run on the new "Fat Macs" with 512 Kbytes of internal memory and one external disk drive. This hardware costs \$3,700. Jazz will cost \$600 and is scheduled to be available in late March.

In keeping with Apple's push to the "unsophisticated" user, Jazz has no macro capability. Adept users of Symphony and Lotus 1-2-3 use the macro to create a "program" that collects time-consuming keyboard entries into one keystroke. Strauss says Lotus could supply this feature for Jazz later.

The Mac celebrates its first birthday this month, and one estimate says that at least 250,000 have been sold. Most have been to home and small-business users. Mac's message has been directed to general computer users, not dp. Rizzo says his company wants to achieve "brand awareness" for the Mac first. But as of this writing, Apple's targeting of "the forgotten manager" and Sculley's statements at Comdex seem to indicate that Apple is still more serious about home and small-business users than about *your* business.

(News continued on page 20)

"[Apple] is being driven not by reality but by wishful thinking."

Michael Hammer, Hammer and Co.

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VISICALC DOESN'T LIVE HERE ANYMORE



Photo by Richard Howard



Photo by Rick Browne/Picture Group

Bricklin (left) and Frankston push Visicalc in the east as Fylstra ghost-markets Visi's out west.

The banner of Visicalc, the electronic-spreadsheet package that gave corporations a reason to buy personal computers, is now behind three separate vendors selling software to corporate professionals and executives. Here's a scorecard to help keep the "Visiware" in focus.

Software Arts Inc., whose founders, Daniel Bricklin and Robert Frankston, developed the original Visicalc in 1979, is still marketing an advanced version of the product called The Visicalc Package, for the Apple II line of personal computers from Apple Computer, Cupertino, CA. Software Arts also plans to market an IBM PC version. (IBM is still marketing an earlier version of Visicalc.)

The third Visicalc architect, Daniel H. Fylstra, marketed the product through his own company, Visicorp. But in the summer of 1983, as Visicalc slid behind 1-2-3 from Lotus Development Corp. (Cambridge, MA) in popularity, Visicorp sued Software Arts, charging that Bricklin and Frankston did not deliver product upgrades in

time. Bricklin countersued, claiming that Visicorp deliberately neglected marketing for Visicalc to push other software.

A Sept. 17 out-of-court settlement, in which Visicorp agreed to pay Software Arts \$500,000, placed strict limits on the names that the former collaborators could give future products. Software Arts was granted exclusive rights to the term "calc" along with exclusive rights to market the Visicalc

product. Visicorp was given the franchise on the "Visi" name, with the exception of Visicalc. It will continue to sell Visischedule, Visiword, and VisiOn. Visicorp also sells a spreadsheet package called Flashcalc, the only "calc" it is able to field under the agreement, Bricklin says.

Visicorp has since merged with Paladin Software Corp., a Santa Clara, CA, startup outfit. Paladin was formed in October 1983 but at press time had yet to come out with a product.

Paladin has obtained the rights to continue selling "Visi" products. Paladin plans to develop new office-productivity software that will run on personal computers from both IBM and Apple.

Fylstra has been quoted as saying that VisiOn, an integrated windowing package similar to IBM's Topview and Concurrent PC-DOS from Digital Research, Pacific Grove, CA, was the key in Visicorp's strategy to recapture the micro-software crown from Lotus. But last August, Visicorp sold the VisiOn technology to Control Data Corp., Minneapolis.

Along with the technology, Control Data also obtained the VisiOn development team. With VisiOn, Control Data plans to allow personal-computer users who buy its timesharing applications to run them in a window on their personal-computer screens, making integration between micro applications and the timeshared services easier.

BIG EIGHT: THE INSIDE TRACK?

A Congressional committee is scheduled to begin hearings next month on auditor independence and, more specifically, whether or not a conflict of interest exists when an accounting firm audits a client to whom it also sells software and management advice.

This matter was investigated by two other Congressional committees during the late 1970s. It has been a bone of

contention between the Association for Data Processing Service Organizations (Adapso) and the Big Eight accounting firms for at least four years.

Adapso members claim that the impartiality of an accounting firm doing a corporate audit is compromised when the accounting firm is also being paid large sums of money for software de-

(News continued on page 24)

DECISION DATA ANNOUNCES A SECOND DECISION

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IBM ON TELECOMMUNICATIONS

Q. CAN A CABLING SYSTEM UNTANGLE TELECOMMUNICATIONS?

A. With all the various devices a company uses to process, move and store information, it's easy to lose sight of one important element—the need to connect all these devices together. That's where a uniform, structured cabling system fits in. But are you just substituting one set of wires for another? Here are some questions and answers that might help you better understand the role a cabling system can play both in solving your communications problems today and in protecting your telecommunications investment for tomorrow.

Q. First of all, just what is a cabling system?

A. A cabling system is designed on a "wire-once" concept. Just as electrical wires are run in buildings today, a cabling system is a permanently installed set of wires that connects the computers, terminals, workstations, telephones and PBXs within a large office building or a campus. This cabling system should also be the foundation for local area networks of the future.

Q. Aren't my computers and telephones already hooked up to a cabling system?

A. It's not so much a cabling system as it is a bunch of cables. Look above the drop ceilings in most office buildings, and you'll discover miles and miles of all kinds of cable. And much of it, strangely enough, is unused. The reason for this waste is that few devices (i.e., telephone, terminal, personal computer, etc.) use the same type of cable. Consequently, when a new device is installed or when one is moved from one office to another, it's quicker, easier and cheaper to run a new cable than it is to remove and reroute the old cable.

This is not to suggest, however, that running a new cable is quick, easy or inexpensive. Relocating just one terminal can cost as much as \$1,500. Not to mention a week or two of downtime while the wiring gets done. And when you think about how often office workers move from one

workplace to another, you can see that we're talking about a considerable expense.

Q. How can a cabling system help solve my wiring problem?

A. Once installed, a cabling system can make wiring for a new or relocated terminal as easy as moving a plug from one socket to another. The IBM Cabling System calls for the one-time installation of a single cable running from each workplace, inside the walls, and into a central "wiring closet." In the office, that cable terminates in a standard faceplate on the wall, not unlike an electrical outlet. In the wiring closet, the cable terminates in a patch panel that can connect it to any number of devices.

The installation of the IBM Cabling System should be considered if you're adding a number of new workstations, installing a PBX, doing a major renovation or building a new office building. In many cases the "wire-once" benefit will cost-justify the IBM Cabling System in five years.

Q. How do the telephone and the IBM Cabling System work together?

A. The IBM Cabling System can be used for data only, or for both data and voice. When the voice capability is used, the voice wires are separated from the single cable in the wiring closet and run to a telephone switching system. Several major PBX manufacturers have tested their PBXs and

telephones with the IBM Cabling System. They report that the voice wires fully support their PBX features and transmission speeds.

Q. How can the IBM Cabling System help me today?

- A.** Currently being installed in office buildings, the IBM Cabling System can connect most of the

available IBM data devices, such as personal computers and workstations, small and intermediate computers. We expect that it will also connect many devices made by other manufacturers.

Q. How will the Cabling System help answer my telecommunications needs of the future?

- A.** The quality and reliability of the IBM Cabling System enable it to transmit data at very high speeds. This makes it the ideal foundation for IBM's planned general purpose local area network (LAN). This LAN, utilizing a "token-ring" technology, can be implemented gradually to connect different workstations, departmental systems and large processors. So by investing in the IBM Cabling System today, you'll not only save money on current installation and rewiring costs, you'll also be better prepared to meet your telecommunications needs of the future.

Q. How do I go about getting the IBM Cabling System?

- A.** There are a number of design and installation companies that can plan your cabling system and do the actual wiring. The cable and accessories are available through authorized distributors. Your IBM marketing representative can provide you with the names of these companies. The cable and accessories can also be ordered directly from IBM.

Q. Where do I go from here?

- A.** Installing the IBM Cabling System today is really installing the foundation for your company's future in telecommunications. So you'll want to plan quite thoughtfully. We can help. If you'd like a free copy of the brochure, "The IBM Cabling System," call 1 800 IBM-2468, Ext. 81, or return the coupon.

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Michael M. Brown

velopment and management consulting contracts by the same organization. The Big Eight accounting firms do most of the auditing for the Fortune 500, which gives them an inside track on much of the contract programming needed by America's largest corporations, Adapso claims.

Adapso has also questioned whether an accounting firm that has created a system that either produces or affects a client's balance sheet should also audit that balance sheet.

The Big Eight firms insist that the provision of auditing and consulting services does not pose a conflict of interest. Despite lengthy investigations, no unethical conduct has been exposed, they note. Even without these multiple services, there's always the possibility that auditors may be influenced by clients that pay for their services, Big Eight representatives assert. "It becomes a question of individual honor," says John L. Fairfield, a partner in Arthur Andersen's Management Information Consulting Division. "Either you have integrity or you don't. In this business, those who don't get in trouble real fast."

The professional organization for accountants, the American Institute of Certified Public Accountants (AICPA) has separate committees that enforce standards of practice, oversee peer reviews of accounting firms by competitors, and have a public-oversight board, with such notoriety as former Secretary of Defense Melvin Laird, that monitors the committee's work. The AICPA has uncovered several mistakes by firms that overlooked work that should have gone into several audits, Fairfield says.

Adapso's interest in this matter is not wholly objective. Many Adapso members are furious because they're "losing business in droves" to large accounting firms providing software-development services to large corporations, says David N. Campbell, chairman of Adapso's CPA Relations Committee.

Campbell's committee has been in-

vestigating the matter, but has been unsuccessful in finding any hard evidence to prove that the accounting firms have been engaged in unethical conduct. In fact, Campbell says that more than

100 users contacted by telephone indicated they were satisfied with their accounting firms' services and were not concerned with the possibility that the

(News continued on page 26)

NEW HP UNIX PORTABLE FOR PROGRAMMERS?



Initially aimed at engineers, HP's new Integral PC may soon be used by programmers.

Soon a dp shop's programmers will be able to create software at home on portable computers, claims Hewlett-Packard. This month, HP plans to announce the first transportable Unix-based computer powerful enough to make your programmers telecommuters.

Priced at \$5,000, the Integral Personal Computer is a 25-pound package that will initially be sold to engineers who need portable computers to monitor and test instruments in the field, according to Doug Hartman, product manager for HP's Unix computers. However, with a Unix program-development package or a C, Fortran, or Basic compiler, programmers can use the machine to develop software at home, Hartman says. The machine offers as much power as many minicomputers: 1.5 Mbytes of internal memory powered by a Motorola 68000 micro-

processor. All that's needed for programming at home is a hard disk for storage, Hartman says. HP also hopes that as more Unix business-applications software becomes available for specific industries, professionals will be eager to use the Integral PC.

The first Integral PC includes enough software to get most engineers started, HP claims. The operating system, HP's version of Bell Labs' Unix System III, includes a windowing feature and an applications manager.

The Integral PC has a built-in ink-jet printer and a 9-inch electroluminescent display that tilts forward and backward. It comes with a single 3½-inch, 700-Kbyte, floppy-disk drive. The Integral PC was scheduled to be announced Jan. 10 and is expected to be available immediately, according to Hartman. For information, call (408) 725-8111.

Q: How Many People Are Afraid Of Your 4-GL/DBMS?

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EZNOMAD is the latest innovation in end-user computing from Dun & Bradstreet. NOMAD, now NOMAD2, has evolved over the years to keep pace with the demands for providing business professionals with maximum computing power. EZNOMAD is a major stride in that direction.

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NEWS & COMMENT

Big Eight's multiple services might create a conflict of interest. Most were as satisfied with the accounting firms' software services as they were with the performance of other vendors.

Campbell's committee had reached a tentative truce with the Big Eight accounting firms when it was announced that Rep. John D. Dingell, (D-MI), the chairman of the House Energy and Commerce Committee, was going to start hearings into the matter. Dingell has retained Jack Chesson, the chief investigator from one of the earlier Congressional probes, to serve as counsel to a subcommittee on oversight and investigation. This subcommittee is conducting the inquiry in its role as an overseer of the federal Securities and Exchange Commission (SEC).

Previous committees, chaired by Senators Lee Metcalfe (D-MT), Thomas Eagleton (D-MO), and Rep. John Moss (D-CA), resulted in two SEC regulations requiring accounting firms to file large amounts of reports on their non-audit activities, Fairfield says. The Reagan Administration scrapped the regulations.

Dingell decided to hold the hearings in the wake of the recent billion-dollar federal bail-out of the Chicago-based Continental Illinois Bank, says Chesson. To add to Dingell's concern, other bankrupt firms have recently been given clean bills of health by auditors—right up to the day they went under.

Dingell's subcommittee is checking into the general subject of auditor independence, but it will also investigate whether accounting firms have been exercising unfair trade advantages over Adapso members by leveraging federal laws requiring public corporations to be audited, says Chesson.

One reason that no "smoking gun" has been found in cases of multiple service by accounting firms, says Chesson, is that lawsuits filed against the accounting firms are usually settled out of court, leaving behind sealed records, which prevent inspection by outside parties.

Campbell says Adapso members

will most likely testify against the Big Eight before Dingell's subcommittee. The Congressional committee, with its subpoena power, is far better equipped to investigate the matter than Adapso is. "I'm happy we don't have to be the

bad guys," says Campbell, who is CEO of Computer Task Group Inc., a supplier of contract programming based in Buffalo. "If Congress examines the situation, they'll want to recommend some changes."

PORTABLE NICHES



Texas Instruments thinks real portable computers wear software designed for special jobs.

Most portable personal-computer users don't need general software such as off-the-shelf spreadsheets, say officials at Texas Instruments Inc., Austin, TX. Instead, portable users require specialized software designed for their particular industries. So, although TI's new Pro-Lite briefcase-size portable will be able to run such general packages as dBase III and Framework from Ashton Tate, TI officials hope that value-added resellers and vendors will develop software for specific industries. For example, at the Comdex Fall in Las Vegas, a New Jersey value-added reseller was offering a software package that helps insurance sales representatives select specific policies for clients in the field.

The 10½-pound Pro-Lite comes with

256 Kbytes of internal memory, expandable to 768 Kbytes; an 80-column, 25-line liquid-crystal display; and a 3½-inch floppy-disk drive. Software vendors say that such popular packages as Multiplan, Supercalc 3, Easywriter, Wordstar, and PFS:File will be available for Pro-Lite early this year.

TI hopes value-added resellers will be able to start distributing industry-specific software for portables by this fall. Priced at \$3,000, the Pro-Lite includes options for a battery pack that will last from two to 12 hours, a second floppy-disk drive, a special processor to handle number-crunching applications, a portable printer, and a 300-baud modem. For more information, call (800) 527-3500.

(News continued on page 28)

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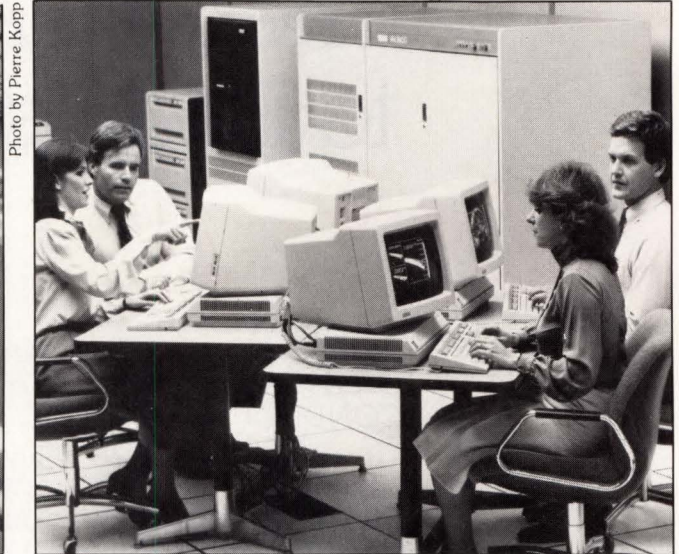
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For the facts on CONDUCTOR, call 1-800-227-3800, Ext. 7005 or drop your business card into an envelope and mail it to Marketing Service, TSI International, 187 Danbury Road, Wilton, Connecticut 06897.

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DEC AND IBM ON SPEAKING TERMS



Users of IBM mainframes (left) and VAX users could send documents back and forth with the new DEC interface products.

When the leading vendor of mini-computers allows its products to more intimately connect with IBM mainframes, users are the winners.

That's the reaction from users following Digital Equipment Corp.'s recent announcement that it has developed interfaces that DEC says will allow users of its VAX minicomputers to obtain and edit documents from IBM mainframes. IBM users accessing VAX machines with these interfaces can capture and edit VAX documents as well. Previously, DEC users had minimum access to data on IBM mainframes by making DEC terminals imitate IBM terminals.

The new interfaces connect VAXs and IBM hosts by connecting the DECnet and SNA networks that the computers are hooked onto. DEC makes a box with software that acts as a gateway between the two networks. DEC also offers interfaces to hook DEC terminals into the IBM environment.

Most users and industry analysts are enthusiastic about DEC's new products. Henry West, dp manager for the Kendall Corp., a Boston-based subsidiary of Colgate-Palmolive Co., says he

will use DEC's new interfaces if they "fit the individual application."

Since all interfaces between Kendall's VAX and IBM systems are currently done manually—reports must be taken off a VAX and rekeyed into an IBM machine—the new interface will help save time and effort, says Gail Levin, a dp project leader.

Although DEC has forged the link, IBM contributed by publishing most of the specifications for transferring documents between computers. IBM maintains that publishing its standards for other vendors is common practice. "Our objective is to make systems as open as possible," says an IBM spokesman. "If our customers benefit, we benefit."

DEC agrees. "Because many Fortune 1,000 businesses use IBM equipment, a lot of money has been invested in IBM," says Norman Becker, manager of market research and development for DEC. "Vendors must offer at least some IBM compatibility. Our products complement IBM's."

DEC says it is the first leading manufacturer to connect its machines to IBM's Distributed Office Support Sys-

tem (DISOSS), an IBM mainframe software package running under the MVS operating system.

One of the new software interfaces is DDXF, a two-way, document-to-document exchange facility that allows users to edit and send documents back and forth between IBM terminals tied into SNA and DEC terminals tied into DECnet.

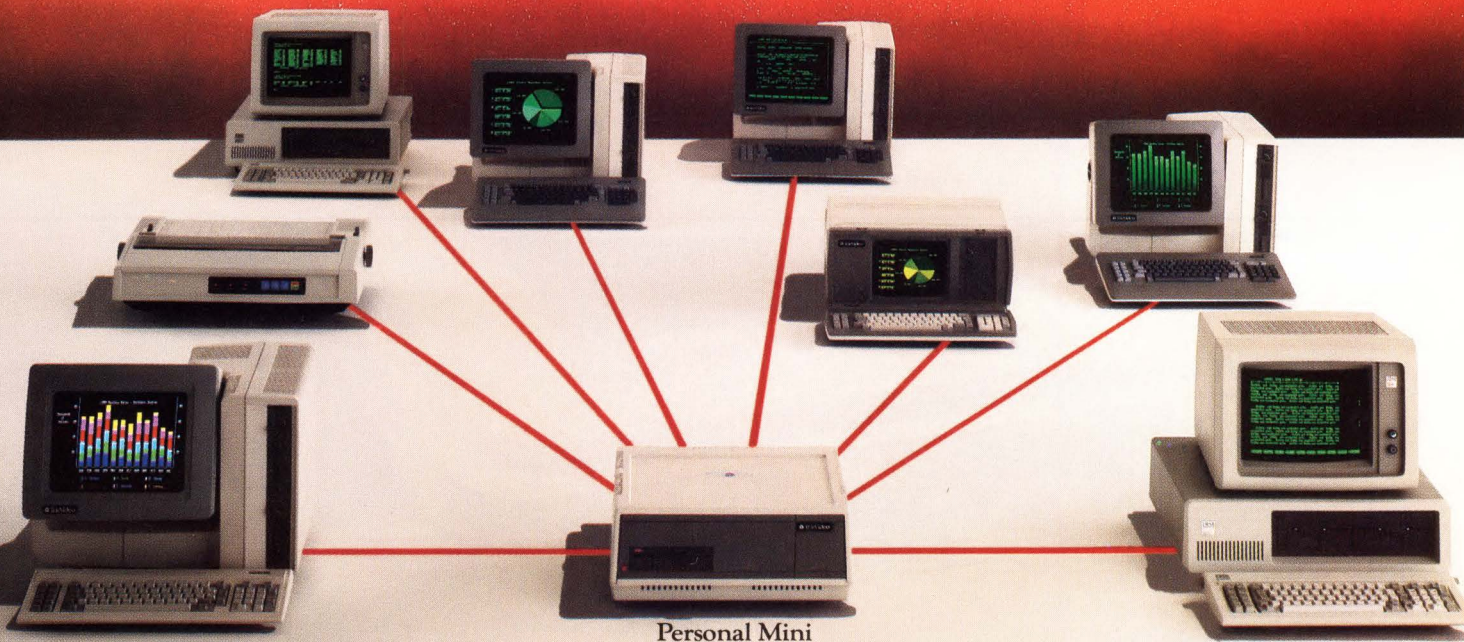
But one analyst, David Terrie, director of office-systems research with the Yankee Group, the Boston-based market-research outfit, notes that DDXF gives DEC users access to documents only in their final form. Although this is helpful for extracting IBM data located in VAX files, reviewing documents, or pulling off an electronic-mail message from an IBM host, DEC users will not be able to fully edit text files, Terrie says, until DEC manages to fully translate the format codes controlling features such as underlining and boldfacing.

The second interface is DHCF, a distributed-host command facility that allows users with IBM 3270-type terminals to access VAX applications run-

(News continued on page 32)

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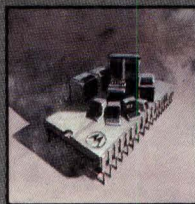


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1984 Motorola/Four-Phase continues to provide hardware/software advances with enhancements to the 2000 Series of communicating desktop computers. The Series now features UNIX, the 68010 MPU, SNA and new high-capacity Winchester disks, making it ideal for large companies with data networks at remote office sites.

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ning under DEC's VMS operating system. The third product is PrE, a printer emulator that prints data from an IBM mainframe on a high-speed printer connected to a VAX.

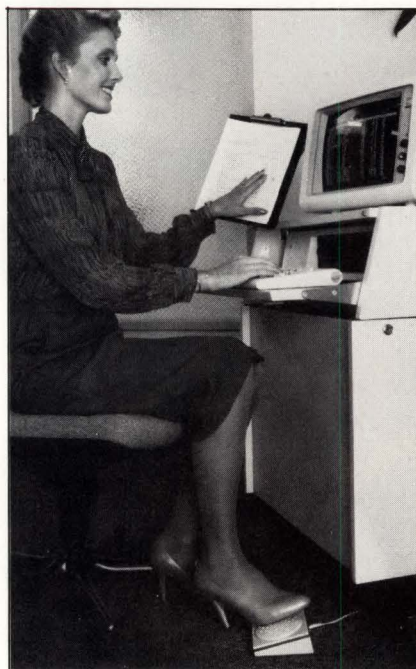
DEC says the interfaces will require some adjustments on both the DEC and IBM networks. For example, users on each network will need security clearance to access information on the other network.

As part of DEC's plan for creating IBM-linked products, it has also signed an agreement with Cullinet Software Inc. (Westwood, MA) to tie VAXs into Cullinet's Information Data Base (IDB). IDB tracks where information is stored in databases on IBM mainframes. The VAX-IDB marriage will allow VAX users to access information stored in any database-management package on an IBM mainframe, says Cullinet. The connection should be available in about a year. Cullinet has cut similar deals with Data General, Westboro, MA, for its CEO software and Wang Laboratories, Lowell, MA, for its VS Professional Application Creation Environment (PACE).

—Kathryn Esplin

EEEE! A MOUSE

Versatron Corp. believes a mouse runs better on the floor than on a desktop. To prove its point, the Healdsburg, CA-based startup has created Footmouse, a foot-operated cursor controller for personal computers. Designed for functions with heavy input requirements — spreadsheets — Footmouse lets micro operators input data twice as fast because it saves keystrokes, says Versatron. Micro users are able to keep their fingers on the keyboard and use their feet as a third hand. Footmouse costs about \$225 and will be available in a few months for all IBM Personal Computers, the Apple IIe and Macintosh, and terminals with RS-232C ports. For information, call (707) 433-8244.



WHAT'S DIS? THE HAMMER KNOWS

Just when you thought it was safe to pick up a trade journal without encountering new abbreviations, Michael Hammer has come up with DIS.

DIS, the Departmental Information System, is a computer subsystem used with a minicomputer-like machine to support various office functions, said Hammer at a recent forum on departmental computing in Cambridge, MA. Hammer is president of Hammer and Co., a management consultancy, and holds a doctorate in computer science from the Massachusetts Institute of Technology, Cambridge.

An example of DIS is a system that serves a sales or purchasing department. Each DIS provides administrative support, communications, and access to information, Hammer told the forum, but each is different because it provides specific functions for the departments it serves.

The essential DIS requirement is a "seamless interface" between the user

and the DIS, Hammer said. "A user should be able to sit at a terminal and not have to know or care where the processing comes from," he said.

As the proponent of yet another dp abbreviation, Hammer cavalierly discounts other "shop-worn" dp catch phrases that have preceded his creation. *Management information systems (MIS)* "is an absolute and unmitigated lie. They are clerical automation systems," Hammer said. *Distributed data processing (ddp)* is a nebulous term that was most closely associated with IBM's information-center concept, a marketing ploy to sell huge numbers of Big Blue's 4300 series of low-end mainframes, he suggested. *Office automation* "gave a professional everything needed to become a secretary." And the term *personal computing* is also a misnomer. "It really means cheap computers on which you can put applications that you couldn't previously justify on larger computers," Hammer said.

DISs will be a key factor in determining the shape of corporate information systems to come, Hammer said. Here is how he sees the future of corporate computing:

- Workstations will provide processing power for applications that are "resource hogs." The days of timesharing processors will be past, and workers will have their own processors.
- The DIS will consist of a minicomputer-like device acting as a filing cabinet for several workstations' applications and data.
- Mainframes will, in effect, become file servers for wide-area networks. They will hold large corporate databases containing information that can be widely shared by the corporation's employees. Mainframes will continue to perform the transaction-processing applications and additional corporate-level applications.

(News continued on page 34)

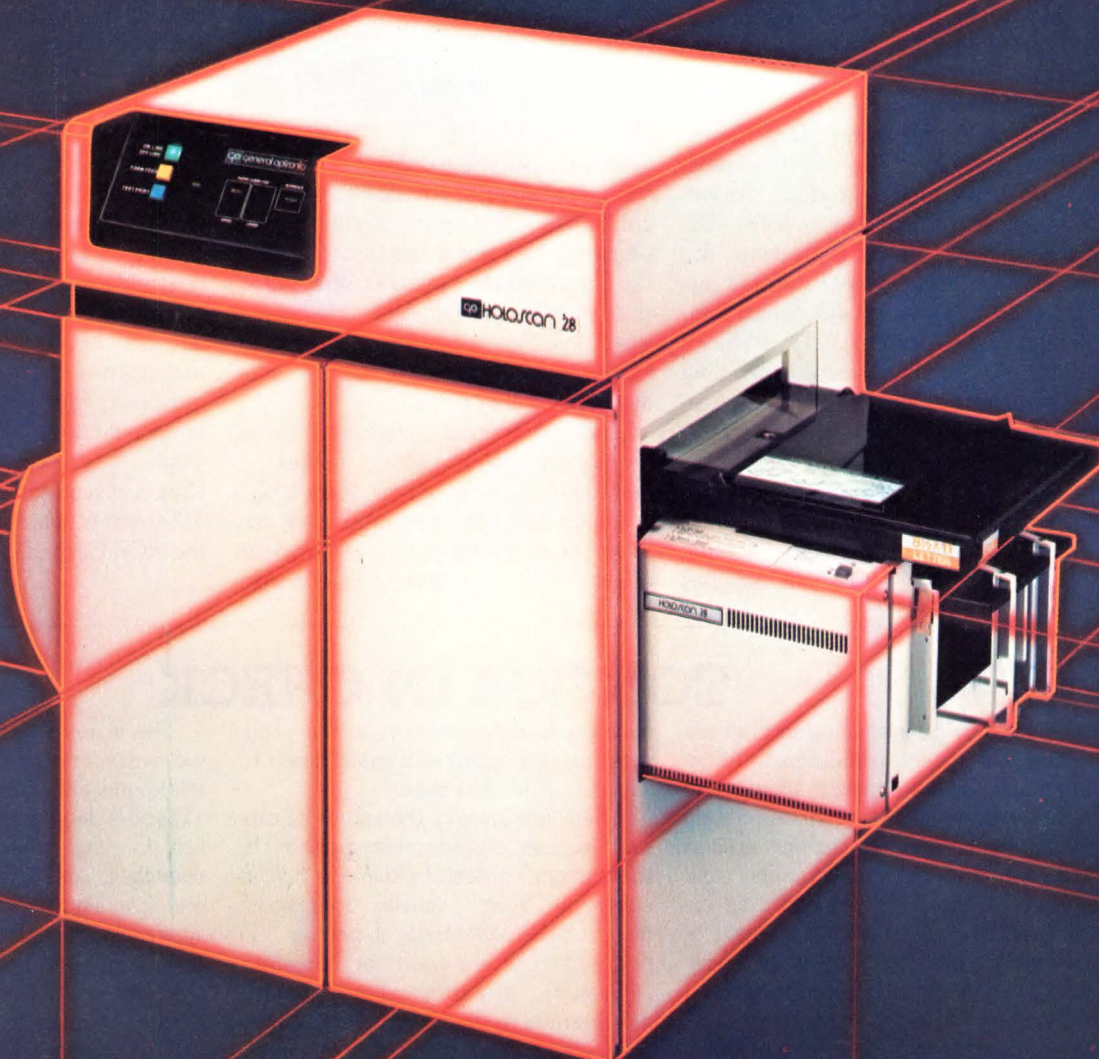
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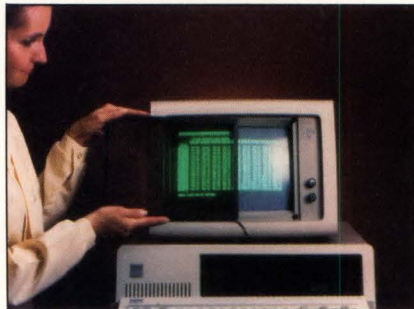
CIRCLE 20

A RASH VDT SAFETY CLAIM?

And you thought anti-glare screens only reduced reflected light on your VDT. Screen Data Corp., Whippany, NJ, says its product also protects VDT operators from getting skin rashes and eye irritations, a claim that is doubted by several of its competitors and a government agency.

The product, Power Screen, contains a wire that hooks onto the VDT and acts as a ground so that the electrostatic field emanating from the display is eliminated, the vendor claims. As the basis for its product, Screen Data quotes a Swedish scientist, Dr. Eugen Ungethum, who believes the electrostatic field coming from the display charges air molecules, which then pick up particles of dirt and dust. Since human skin tends to carry a negative charge, these positively charged particles are attracted to the VDT operator, causing skin rashes and eye irritation to workers with sensitive skin or eyes, according to the scientist.

The National Institute for Occupational Health and Safety (NIOSH) has



Power Screen's ground wire (in center) is key.

received very few complaints from VDT operators about skin rashes, according to Gene Moss, a staff health physicist. "It's not a major problem in the United States," Moss asserts. VDTs pose many other health and safety questions, Moss notes, and focusing on skin irritation is like "looking at one leaf in a forest full of trees."

The American Hoechst Corp. (Somerville, NJ), which makes a glare-reducing filter, agrees. Mark Ober, a spokesman, says his company is not aware of any proof that the electrostatic effect exists. —Michael Dobberstein

SPERRY OFFERS UNIX

The Sperry Corp. says it's the first vendor to offer Bell Labs' Unix operating system on micros, minis, and mainframes. This will give users portability of software between different-sized computers, Sperry says.

However, some reprogramming will still be necessary when transferring software between micros, minis, and mainframes because Sperry's machines run under three different versions of Unix: Microsoft Corp.'s Xenix, the Berkely 4.2 version of Unix, and Unix System V. The code for all the Unix programs will be written in C. Sperry has also added a new Unix operating system, the SX 1100, that will run as an application under its regular OS 1100 operating system for mainframes.

Sperry, Blue Bell, PA, made this announcement at Comdex Fall in Las Vegas. It will resell two new lines of Unix minicomputers, the 5000 and 7000 series, which it has obtained from the NCR Corp., Dayton, OH, the Arete

(News continued on page 36)

TONGUE IN CHECK

A lamentable phenomenon in business writing and speech is the dearth of action verbs. Browse through almost any business periodical. Circuitous, cloudy constructions liberally pepper articles covering the announcements and speeches of corporations and their executives. That most neglected part of speech, the action verb, could easily elucidate most of this roundabout writing.

Consider the following examples:

- "Reaction from representatives of information industries *has been* very positive to . . ." becomes much stronger when replaced with "Information-industry representatives *reacted* positively to . . ."
- And if "The software developers

have made enhancements to the products," isn't it easier and more direct to say they *enhanced* them?

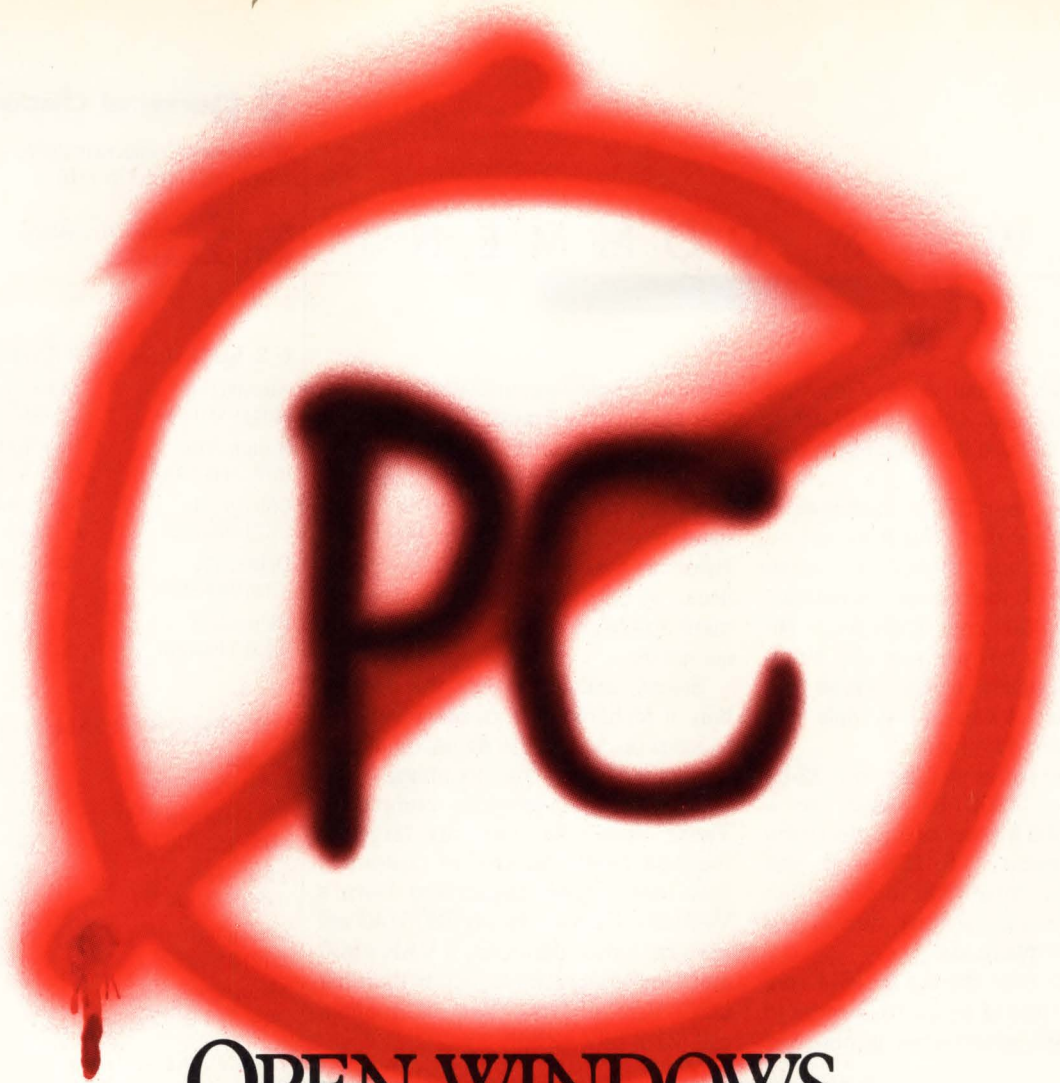
There are literally thousands of others: "causes considerable damage to the system" means to *damage* it; if a company "hasn't ceased operation," it's probably *operating*; if people "do text editing," it's a good bet they *edit*.

Similarly, if a corporation "is giving important consideration" to a potential acquisition, it's *considering* it; a vendor that will "facilitate the provision of basic service" *provides* it; and although some attest that corporate information centers "are productivity improvement mechanisms," most managers would be thrilled if they would simply *improve* productivity.

This is not pedantic nit-picking. How we write and speak reflect how we think and act. For managers—whose superiors (and subordinates) read, listen to, and evaluate their reports, speeches, and presentations—writing and speaking strongly and directly are especially important. By omitting action verbs, you appear passive rather than active, indecisive instead of committed, forceless rather than forceful.

The English language abounds with action verbs—words that can convey strength, vision, precision, commitment, and clarity. How you choose to use them mirrors who you are and, ultimately, perhaps, where your career is heading. Choose with care.

—Barbara Francett



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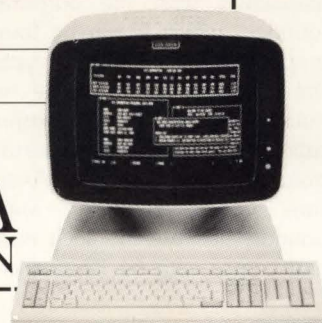
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NEWS & COMMENT

Systems Corp., San Jose, CA, and Computer Consoles Inc., Rochester, NY. Both lines will be available in two months.

There are four 32-bit machines in the 5000 series that offer from one to 16 Mbytes of internal memory, serve from one to 64 users, and will cost between \$15,000 and \$150,000. Although Sperry has plans to add a networking capability to the whole line only the two lower-end models can presently be networked.

The 7000 series includes one 32-bit machine, the 7000/40, which has a maximum of 8 Mbytes of internal memory, can support up to 128 users, and is priced from \$160,000 to \$300,000. Sperry does not yet have networking software for this model.

Sperry is also offering an IBM connection to users of its micro. Access to data on IBM mainframes is obtained

through a software-emulation package that enables the Sperry Personal Computer to imitate an IBM 3270-type terminal. In addition, Sperry has announced that software from other vendors will be sold with the machines, including a series of programs for offices, a relational-database management system, Cobol, C, and Fortran compilers.

Sperry executives say the acquisition of technology from other vendors is helping shed its image as an "old, stodgy mainframe company." These officials say they are targeting the new minicomputers at customers now using Digital Equipment Corp.'s VAX line. Sperry says its 7000/40 will perform better than DEC's VAX 8600 and almost eight times better than the DEC VAX-11/780. For information, call (215) 542-4213.

EBB AND FLOW VICTOR VICTORIOUS?

It's nice to hear a story with a happy ending. *Victor Technologies* (Scotts Valley, CA) says it expects to be out of Chapter 11 soon. The maker of the Victor 9000 family of personal computers filed for Chapter 11 last February. The company has since paid off its \$28 million debt, according to Roy Wright, chief operating officer. It has also introduced a new IBM-PC-compatible portable to help spur its recovery.

Can the Phoenix rise? In 1983, the *Osborne Computer Corp.* (Fremont, CA) filed for Chapter 11 reorganization to avoid bankruptcy. The flamboyant Adam Osborne is no longer associated with the corporation he founded, which is run by four former employees. It's been five years since the Osborne 1 portable was announced. Now, the restructured corporation is offering two new portable computers. The Osborne 4 Vixen, which runs CP/M software, weighs 22 pounds, has two 5¼-inch disk drives, and comes with 64 Kbytes of internal

memory. The Osborne 3 Ultra-Portable Computer, which runs MS-DOS programs, has 128 Kbytes of internal memory, two 5¼-inch disk drives and weighs only 9½ pounds.

Otrona Advanced Systems Inc. (Boulder, CO) recently stopped operations and dismissed all its employees. The company's failure to obtain credit and capital, coupled with higher-than-expected production costs for the Otrona 2001, prompted these actions. The 2001, introduced last May, is a 19-pound Intel 8088-based transportable.

Management Science America Inc. (MSA), the Atlanta-based mainframe-software company, says it's reviewing about 30 buyers for its micro-software subsidiary, *Peachtree Software Inc.*, which was acquired in 1981. MSA's difficulty in selling micro software to its mainframe-software customers was cited as a main reason for the impending breakup, according to Larry Smart, Peachtree's senior vice president.

(News continued on page 40)

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*Source Datamation Magazine 1983 Brand Preference Study of printer preference by end users and OEM's.

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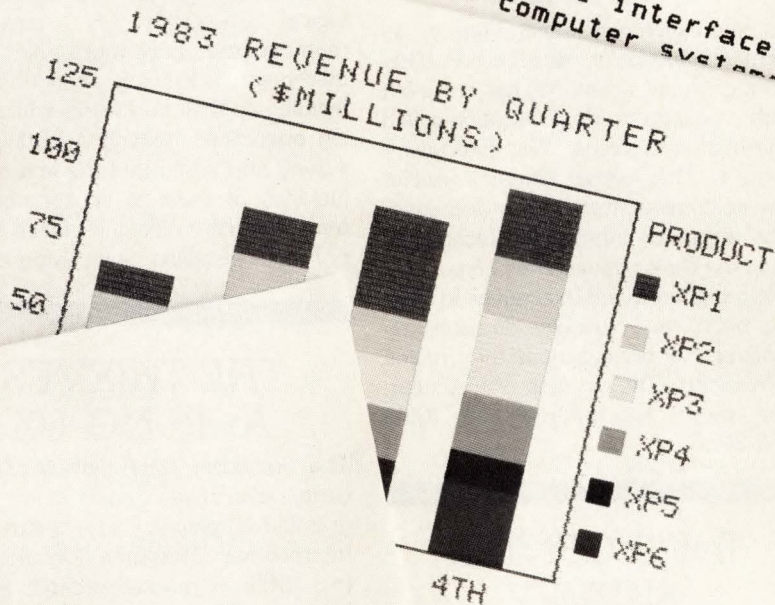
November 1

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NEWS BRIEFS

HIDDEN COSTS

A personal computer costs much more than its price tag on the dealer floor. A recent study by Frost & Sullivan Inc., a New York-based market-research house, concludes that *after* paying about \$2,500, an IBM PC owner will spend an average of \$1,315 for software during the first year of ownership. The survey was sent to 6,000 users of IBM PCs and compatibles in corporations, small businesses, and homes. Of the 650 responses, software purchases were split between those made at the time the hardware was bought, and those made later. And Joseph Savino, director of computer studies at Frost & Sullivan, projects that by 1986, micro owners will be spending even more money on software for their personal computers during the second year of ownership than during the first year. The survey also found that most users are buying word-processing software, followed by spreadsheets, database-management, and integrated-function packages.

FIXX SOFTWARE

Micro Education Corp. of America (MECA) has introduced a personal-computer software package for runners. The Running Program, written by the late James F. Fixx (who died of a heart attack while running), is a "personal coach" that helps runners set individual goals and improve their running and overall fitness. The program first evaluates the user's fitness with a series of simple tests for ideal weight, resting heart rate, heart-attack risk, and a walk/run test. This information is incorporated into a personalized day-by-day training schedule. The program prints this schedule and keeps track of the runner's progress. The Running Program also predicts the runner's probable race times and best competitive dis-

tance. It also includes six illustrated stretching exercises to help minimize injuries. The Running Program costs \$80 and is available for the IBM PC, PC XT, PC AT, and Compaq Portable. For more information, call MECA, Westport, CT at (203) 222-1000.

EXECUTIVE JOURNAL

To help executives manage today's information explosion, Auerbach Publishers Inc. (Pennsauken, NJ) has come out with a new quarterly publication called *Information Strategy: The Executive's Journal*. The journal contains articles and columns written by top executives who approach information technology from the senior manager's perspective. It is designed to aid executives in making policy and strategy decisions regarding their organizations' information technology. The price is \$65 a year. For more information, call (609) 662-2070.

INFO-CENTER SURVEY

Crwth Computer Coursewares (Santa Monica, CA) is looking for 2,000 participants for its second annual survey on the status of the information center. The questionnaire will investigate the stages of implementation, user population, staffing requirements, and responsibilities of the information center. Other questions will include what software and hardware is used most frequently by information centers, and the roles of the personal computer and the mainframe in end-user computing. To determine the growth and development of the information center in 1984, these results will be compared to last year's survey. Questionnaire respondents will receive a free copy of the survey results. Interested parties may obtain copies of the questionnaire by calling (213) 391-6788.

MIPS CRAZY

Manufacturers replace existing computer systems when they need more horsepower—not more technology. Xerox Computer Services (Los Angeles) reached this conclusion after surveying 100 manufacturers with \$25 million to \$100 million in revenues. William Fello, president of Xerox Computer Services, says that although technological research is necessary, manufacturers have more practical requirements. Primary concerns are building up their businesses while keeping operations running smoothly. The survey also found that the fear and reluctance of users to accept new systems are major difficulties faced by corporations installing new computers.

THE THIEVES AMONG US

The computer thief that worries security executives most is the "disgruntled employee," says a survey by International Resource Development Inc. (IRD), a market-research firm in Norwalk, CT.

IRD maintains that disgruntled employees have always found a way to take their frustrations out on the company, but "with a powerful accomplice, the friendly microcomputer," getting revenge has been made easier. Before the popular micro, only a select few knew how to access computers. Today, millions of employees have access to use or abuse office micros. IRD gathered its research from a series of informal telephone interviews with 30 dp and corporate security-department heads in 30 major corporations.

Due to shortsightedness, few corporations have taken steps to protect information stored on micro hardware and software, says IRD. The report also guesses that proper security measures usually aren't taken until a company's database has been violated.

Both letter-quality and draft hard copy

Fastest document throughput in its class

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TI reliability

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The TI 855 microprinter. No other printer says better so many ways.

Feature for feature, no other microprinter can match the versatility, compatibility, reliability and productivity of the OMNI 800* Model 855 microprinter. Here's why.

Two Printers In One. With the TI 855 you get the speed of dot matrix draft copy. Plus the precise clarity of the most advanced matrix technology for letter-quality print. It's two printers in one — at one low price.

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Hardware Compatible. The TI 855 microprinter is compatible with all major PC hardware. And it provides both serial RS232C subset and "Centronics-type" parallel as standard interfaces.

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Tough Font Modules For Quick Character Change. Three font modules can be inserted into the front of the printer at one time, and are accessed individually. Each contains both draft- and letter-quality character sets. They're easier to use, more reliable and more durable than traditional metal or plastic daisy wheels.

More Productivity Than Any Other Microprinter. The 855 offers both friction and tractor paper feed, to handle all types of word and data processing applications. A quick-change snap-in cartridge ribbon. Raster and mosaic graphics. And intelligent printing which maximizes document throughput — regardless of format.

Get the printer that makes for better information systems. For more information visit your nearest TI authorized dealer or write Texas Instruments Incorporated, P.O. Box 809063, Dept. DPF0830C, Dallas, TX 75380-9063. Or call toll-free: 1-800-527-3500.

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Susan Foster Bryant, Microsystems Editor



Illustration by Dan Culhane

SOFTWARE THIEVERY

The scene is a familiar one: Joe Smith hears that Jean Wallace is using Whizbang II Performance Enhancer software. He's been dying to get his hands on this program—all those he competes with are using it, with incredible success. He visits Jean, an old friend.

"Hey, how ya doin'?" I heard you're using Perf II. Is that true?"

"Yeah. It's great. You should try it."

"Would you copy it for me?"

"Sure, I'll do it right now."

A blank disk is inserted in one disk drive, Perf II in the other. Jean enters the command to copy, and within two minutes, the copy is made. Joe is thrilled. He really wanted this program for his budgets. In many companies, Joe's manager would be thrilled, too: By having the program copied, Joe just saved the department \$500. In this case, however, Jean Wallace just got herself fired for theft and so did her manager.

What is a manager's culpability in

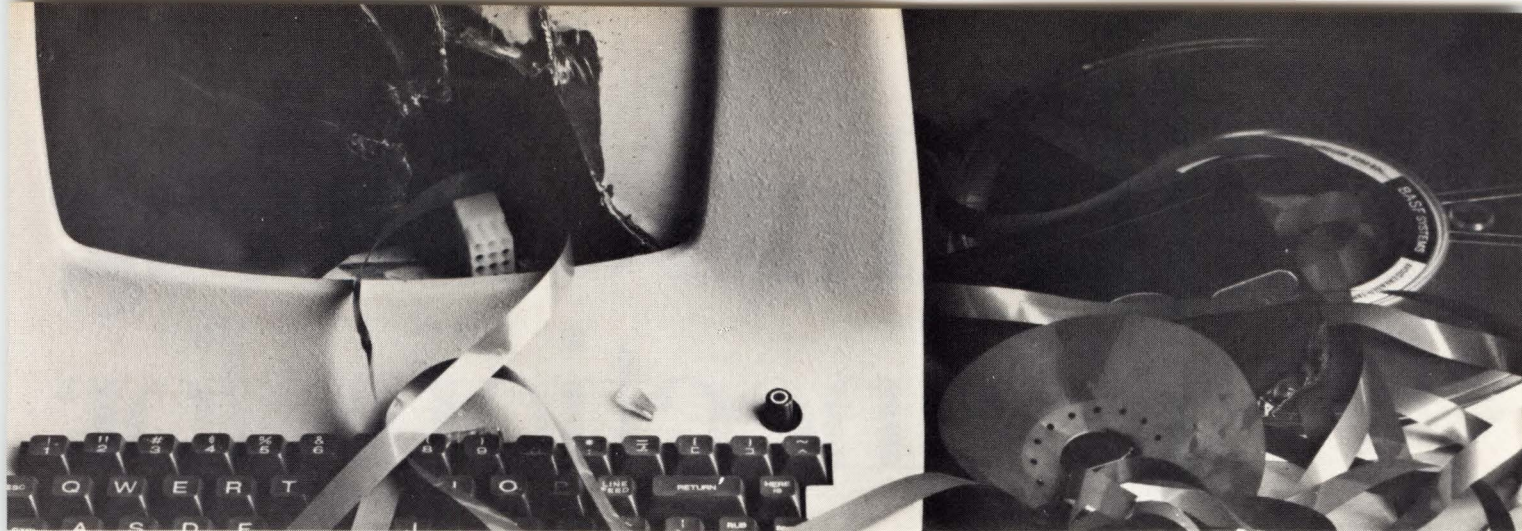
cases of unauthorized software copying? That depends on the laws of the state and the facts of the case. Generally speaking, a superior is responsible for an employee. "If the employee is working at home on a personal computer with an unauthorized copy of a program, the manager is not responsible, unless he or she knows about the work. The manager can always contend that no one was authorized to steal. However, if the manager knows about it, he or she and the corporation are responsible," states Bernard Bonn III, attorney for Lotus Development Corp., Cambridge, MA.

Until now, many organizations have done nothing to stop what amounts to an illegal act. In fact, software thievery has often been encouraged to spare company budgets the cost of buying many copies of software packages. Recently, however, many corporations were given pause when Lotus sued Rixon Inc. (at the time a subsidiary of Schlumberger Inc., but now owned by

Computer and Systems Engineering of Watford, England, and located in Silver Springs, MD). Rixon employees, Lotus alleged, had made unauthorized copies of Lotus 1-2-3, the best-selling financial-software package, for the company's branch offices. Lotus offers volume purchasing arrangements, but such bulk licensing apparently doesn't inhibit copying, and in many cases its effectiveness is further reduced by the fact that bulk sales are regulated by anti-trust laws, according to Bernard Bonn.

Lotus filed a \$10 million copyright complaint last January. Rixon quickly settled out of court for an undisclosed sum. Shortly thereafter, in June, Lotus sued Health Group Inc. (Nashville, TN), once again testing a new tactic in piracy warfare: corporate fear of embarrassing public exposure through lawsuits. Interestingly, Rixon fired only the employee who blew the whistle on the company, whereas Health Group fired the employees who did the copying.

(Continued on page 46)



"Oh no! Somebody got into the computer room last night."

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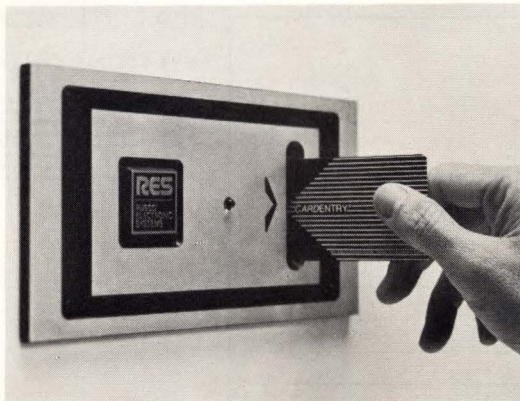
utilizes compact CARDENTRY readers. You tell your system who's allowed in and when. Then, if an unauthorized person tries to enter the facility the door won't open.

What's more, the RES CARDENTRY system tells your security guard where and when an unauthorized entry has been attempted - in easy-to-read English text.

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(Continued from page 42)

These weren't the first attacks by a vendor against software thievery: For years, vendors have sought ways to end unauthorized program copying.

Thus, the Rixon case is attracting much attention, perhaps in the hope that U.S. businesses will slam the lid on employees who would steal. Software piracy is an issue of corporate culpability, which may result in public questioning of a company's integrity.

At stake here is more than a corporation's public pride. A substantial amount of corporate financial pain is also on the line: For every copying incident Lotus discovers, the copyright laws allow Lotus to sue for \$50,000 every time a copy is used. These cases are civil actions; however, Lotus has some potential criminal actions underway involving investigations of illegal bootleg versions of Lotus 1-2-3 brought in from foreign countries. U.S. Customs officials are involved in such alleged violations of trade laws.

Some corporations have decided to confront the piracy issue head-on, by writing policies on software use and abuse. Travelers Corp. (Hartford, CT), for example, sends memos out every six months. "We notify employees that unauthorized software copying by personal-computer users is forbidden.

We have strengthened this stand by making this a corporate policy rather than just a data-processing policy. In short, people who copy will be terminated," says Thomas Otman, second vice president of dp.

Personal or business use of unauthorized copied software is strictly prohibited at any time, according to Bill Wood, computer standards and control supervisor at Ford Motor Co. (Dearborn, MI) headquarters. And, although it's not a written policy, Exxon Corp. includes rules against copying software in the seminars it conducts for its personal-computer users.

If these measures aren't enough, perhaps technology will help forestall theft. Lotus and Microsoft Corp. (Bellevue, WA), for example, are working on a device to keep more than one person at a time from using a software package. The device is placed on the computer the software is run on. This device is not expected to be available before 1986. Software owners will be allowed to make backup copies (some current protection schemes don't allow back-up copies) in case the original software is damaged.

Until that time, however, software-theft legal battles will continue to be fought. For example, Louisiana approved a law that establishes the valid-

ity of the software-contract agreement on software packages that forbids a manager or subordinates to duplicate a program. Similar efforts to make the software-thievery issue a contract-law issue rather than a copyright issue are taking place in several other states as well, including Georgia and California.

What should you as a manager do until the software-theft problem is resolved, either legally or technically? Start by making sure no unauthorized programs are floating around your department. The next step is to make sure all your subordinates are aware of the consequences of their actions. Then, be sure that top management is aware of the implications of improper software use and the possibility of legal action.

Further steps, if necessary, may include having employee fingerprints put on disks. The fingerprints act as locks, enabling only the licensed employee to unscramble the program. Further information on this method can be obtained from Vault Corp., 2649 Townsgate Road, Westlake Village, CA, 91316.

The best protection is to be aware of what's going on around you and to be informed about the possible consequences. You may save your corporation a great deal of embarrassment—and money. □

COPYRIGHT CAVEATS

A manager's culpability in a case of unauthorized software copying is extensive, according to Paul Supnik, one of the country's foremost copyright-law specialists. Supnik is based in Beverly Hills, CA.

"Beyond the corporation's liability, a manager can risk personal liability from copyright infringement as a related defendant in a copyright-infringement lawsuit. The greater the manager's involvement and participation, knowledge, and ability to control and set policy, the greater the likelihood of liability for infringements made by those the manager supervises.

"Defenses to liability that could be raised about the validity of the 'shrink-wrap license' [this license is the agree-

ment found inside software packages that states conditions of usage, including the warning that copying the program is prohibited] are, for all purposes, only theoretical. Thus, a software company that seeks to make an example of an errant dp manager may take a tough stance.

"A recent Louisiana statute provides that if certain conditions are fulfilled by the computer-software publisher, the shrink-wrap agreement is valid. This has the effect of making copyright infringement easier to establish in Louisiana. The shrink-wrap agreement is an enforceable contract. Therefore, any unauthorized copying is a copyright infringement.

"The effect of the Louisiana statute on copyright-infringement situations

can be a two-edged sword. The Louisiana statute, while placing the stamp of approval of a state government on the shrink-wrap license, requires certain conditions to be fulfilled before the shrink-wrap license is enforceable under the statute. The terms of the agreement must be clearly and conspicuously stated in language readily understood by the average person. Moreover, the statute requires a statement that a person who does not agree to the terms of the agreement may within a reasonable time return the unused, unopened software to the party from whom it was acquired for a full refund. Probably the most important effect of the Louisiana statute will be the adoption of similar statutes in other states."



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STRICTLY SOFTWARE

By Peter L. ODell, Guest Columnist



Illustration by Dan Culhane

SIMPLE VIRTUES

System integration can strengthen individual applications through the cooperation of many. Or, it can be a web, entangling software development and resources and delaying projects. The outcome largely depends on MIS/dp's ability to discern when integration is desirable and to recognize the benefits of maintaining some stand-alone applications.

A stand-alone application stands apart from an organization's main, integrated systems. The separation may be physical, through the use of separate hardware, or only logical. Data links to the stand-alone application are limited, clearly defined, closely controlled, and infrequent. The application performs a function that is independent of the main systems, or relies on only a small section, or snapshot, of data from them.

Guest columnist Peter ODell is director of technical services for Criton Technologies, a diversified manufacturing company headquartered in Bellevue, WA.

Decision-support analyses, which require only occasional summaries of master files, are good candidates for the stand-alone approach. A high-level sales analysis, for example, might need only a monthly data feed from the operational files rather than two years of historical information.

The increasing power of personal computers makes the stand-alone approach more and more feasible. End users are able to employ spreadsheets, other commercial packages, and personal software with minimal support from MIS/dp. Although the development of micro-to-mainframe links enhances the appeal of personal computers for departmental and individual applications, a direct connection to the corporate database may not always be necessary. It may, in fact, cause complications, such as the need for communications protocols and security. Many times reinputting data will suffice as the only link between the corporate database and a stand-alone application.

Here are some reasons to use stand-alone applications:

Simplified development: Because the interface usually represents a large part of the development and testing for an integrated application, isolation from the main systems dramatically reduces design complexity. The interface between the stand-alone application and main systems, if there is one, should be straightforward, such as a nightly download of a single file. It should not involve detailed database searches or interaction in other complicated ways. Development, therefore, can focus on the new application's requirements. A simple interface also limits possible damage to the existing systems, which may occur whenever a new piece is added.

Rapid development: The stand-alone application's simple design allows for speedy development. This feature helps ensure that the application will arrive before it becomes obsolete, as often happens with large, lengthy proj-

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ects. Quick development also leaves little time for the enthusiasm of management or users to wane.

Tighter security: Many companies are opening their systems to customers and vendors to automate ordering, distribute product information, and provide electronic mail service. MIS/dp managers who worry about the security implications of these applications can divorce them from the main systems.

Enhanced performance: Stand-alone systems themselves should work rapidly. And since the stand-alone has no—or very limited—access to the main systems, their performance won't decay because of the new application. If the stand-alone and main systems exchange information infrequently—perhaps only once a day—the organization may avoid networking costs completely, passing the data via tape or floppy disk.

Technology evaluation: Running a new application stand-alone on a rented

piece of equipment or via a timesharing service gives the organization a good look at the package with relatively little risk. Putting micro software to work on an isolated application offers a more complete, accurate evaluation than is afforded during a brief trial run by MIS/dp or an information center. But MIS/dp can help users begin an application and encourage them to record their experiences with the package. If the software is satisfactory, it can be recommended for wider use in the organization. The documentation can help prospective users decide whether or not the product is for them.

Easier conversions and implementations: Stand-alone systems can cushion the shocks of a rapidly changing data-processing shop. If their input and output designs are flexible, these applications can survive even when the main systems change. This continuity takes some of the sting out of implementation.

Prototyping: An organization can also use stand-alone applications to phase in larger systems. Implementing a large system by gradually turning on independent modules eliminates turning on the whole system simultaneously, which can lead to disaster when the program won't work. Users of early stand-alone modules can recommend improvements to developers that are working on later pieces, so design enhancements can be made before delivery. A manufacturing system's bill-of-materials module is a good candidate for this approach. Users can load and verify their data and practice with the subsystem before the entire system is turned on. This phased implementation is an efficient way to prototype larger systems. Analysts design the overall system, then identify the modules that can operate independently. These modules are quickly developed, immediately performing tasks even as they guide the analysts in designing the rest of the system.

Complete testing: Developers often rush the testing of integrated systems in order to get their projects back on schedule. With stand-alone systems, testing is easier since the interfaces to the main system, if any, are straightforward, which means less chance of error. And, since development is rapid, there is more time to test. When stand-alones are used to phase in a larger system, the testing can be spread throughout the implementation period. Even if bugs appear during use, it's fairly easy to eradicate them before the entire system is switched on.

Prospecting: Organizations often have difficulty pinpointing or measuring the benefits of proposed applications. While an application may appear to be a worthwhile investment, neither MIS/dp nor the prospective users can predict what the payback will be. Stand-alone treatment lets users test an application with relatively little risk because development costs for stand-alone systems are a fraction of those for fully integrated ones. The difference may be enough to make a marginal proposal worth a try.

Motivation and training: Systems analysts love stand-alone projects because

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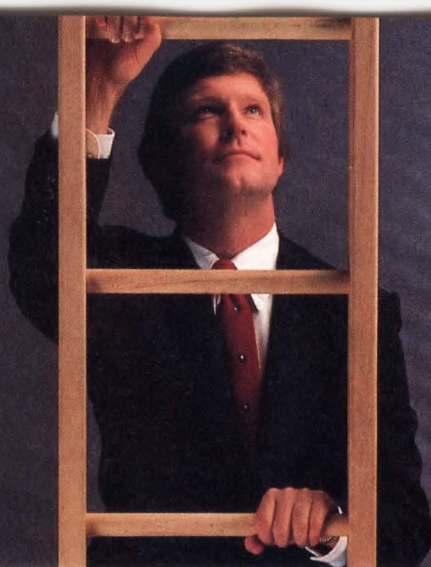
COMPLEXITY'S COST

Mathematical models that predict software-project costs or rate actual expenses against a hypothetical norm, treat program complexity as one of the most important variables in the development formula. Barry Boehm, author of *Software Engineering Economics* (Prentice-Hall, 1981) rates it second in importance among fourteen factors influencing software productivity—just behind the project team's degree of experience. According to Boehm, software may occupy any of six complexity levels, from "extra high" to "very low."

There's no easy way to judge a project's complexity, but Boehm offers guidelines. He points to four software characteristics that can vary in complexity: the computations the program performs, the operations that control its execution, input and output requirements, and data management. Except for computational needs, which are determined by the application, these characteristics closely relate to the

level of integration.

For example, Boehm's guidelines assign the third complexity rating to programs that include these characteristics: some intermodule control, device selection, status checking, error processing for input-output operations, data-management functions that allow multi-file input and single-file output, straightforward structural changes, and simple edits. Even very simple integration involves all of these factors. On the other hand, programs with straightline control, easy read and write statements for input and output, and data stored in simple arrays in the main memory—the characteristics of stand-alone systems—fall within the lowest complexity category. A move from simple integration to stand-alone development, therefore, would take a system two steps down in complexity for a 30 percent productivity savings. A move from an even higher complexity level, offers the opportunity for even greater savings.



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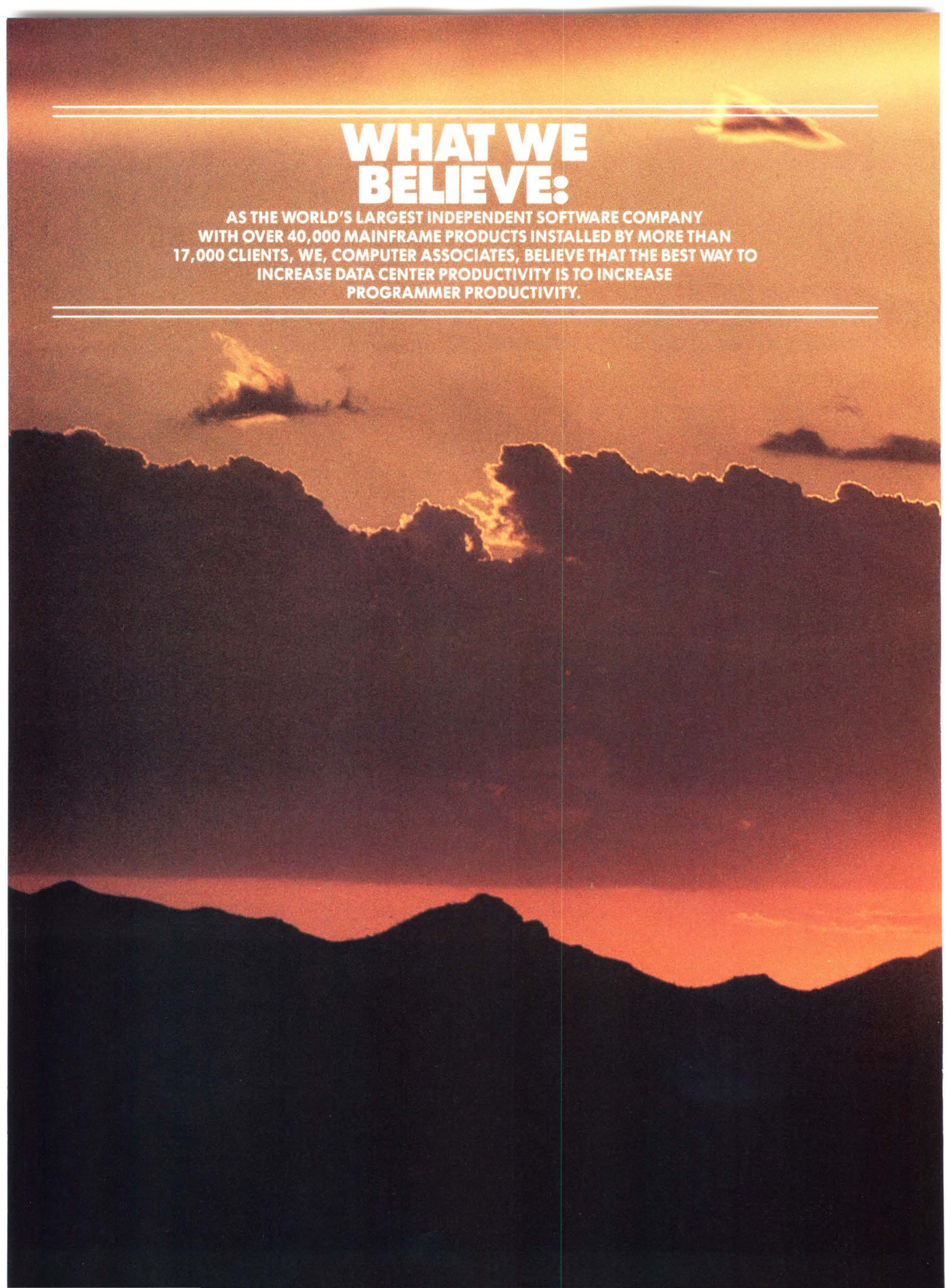
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(Continued from page 50)

they get a chance to shine. Users and others in the organization can see tangible results from the analyst's labor. It's been my experience that most analysts

prefer to have several small, successful applications to their credit rather than one major project that took two years and involved hundreds of developers. Organizations can use stand-alone proj-

ects to motivate staffers, but they must use the technique carefully to avoid draining resources from ongoing, integrated development efforts. The stand-alone project, however, also offers a good training ground for new programmers and analysts. Failure is not as costly on a limited system as it is on a major project. And the size of stand-alone applications affords participants the chance to work on all phases of development—problem analyses, database and system design, coding, testing, and user training.

Stand-alone applications offer advantages. But here's some not-so-good news about them:

Opportunity costs: Because integration of closely related functions can be critical to an organization's information strategy, MIS/dp must carefully select applications for stand-alone status. A miscalculation can get you fast, visible results, but leave you with an information system that resembles the Tower of Babel. This postpones the benefits of integration and raises the cost of achieving it.

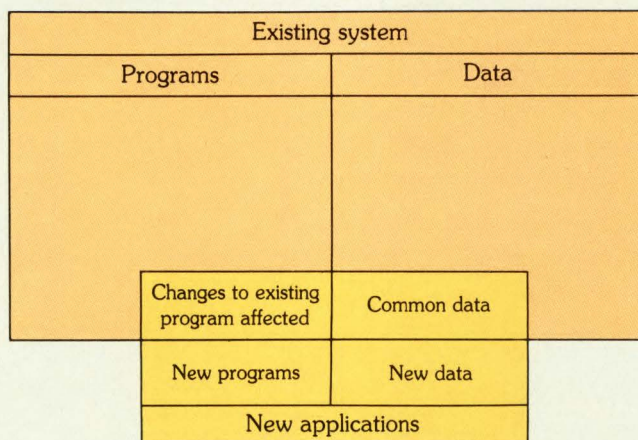
Limited functionality: Isolated systems won't carry the benefits of integrated ones. Users may not be willing to trade the joys of integration for the efficiencies of stand-alone application, which primarily benefit MIS/dp. MIS/dp should consult users about the trade-offs involved in the decision to go stand-alone.

Data duplication: There will be some data redundancy with any stand-alone application. This means there will be a need for synchronization of updates and corrections. If the application has been chosen carefully, the problem should be manageable. If synchronization becomes a major problem, you've either chosen the wrong application or the requirements have changed. In either case, you can begin designing integration without suffering any major loss.

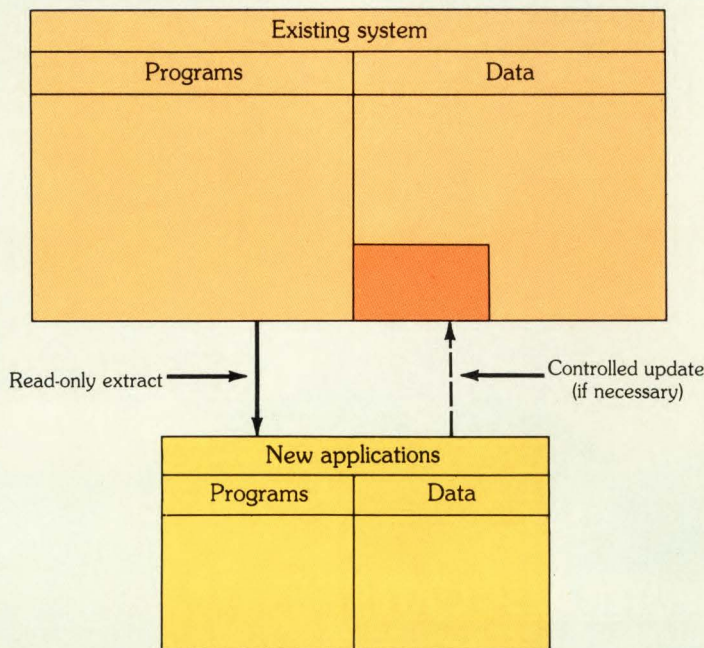
Inefficient use of resources: Stand-alone applications, while not integrated with the main systems, must fit the organization's overall information strategy. While stand-alone development's relatively low costs allow some prospecting for uncertain paybacks, the method should not detract from the organiza-

STAND-ALONE VS. INTEGRATED APPLICATIONS

INTEGRATED



STAND-ALONE



This chart demonstrates the pros and the cons of the integrated and stand-alone approaches to new applications. Developing the changes to existing programs and designing the shared databases necessary for integration takes effort. The chances for mistakes are greater and maintenance is more difficult. On the other hand, the stand-alone approach requires some data redundancy and could cause problems in the synchronization of updates.

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tion's primary development efforts. MIS/dp should work with top management to decide which applications deserve development effort—and in what order.

What should you look for when assessing candidates for stand-alone treatment? First, examine the relationship between the main system's data and the data needed for the stand-alone application. Functions that are totally independent of day-to-day production systems are, of course, prime candidates for stand-alone development. Next, look at the frequency requirements for data updates between systems. Applications that need only occasional data feeds are good stand-alone candidates. For example, a company processing credit-card purchases will have a production system that handles thousands of transactions a day. To track the company's daily position, an accountant will need only a few bits of summary information derived from those transactions—total charges and total receipts from a few customer categories. The accountant can then type those summaries into a personal-computer spreadsheet, perform the 20 or 30 calculations needed to test the company's standing, and dispose of the data.

An application that needs real-time updating probably isn't appropriate for stand-alone treatment. But such an application may be kept stand-alone if the interface is clear and data moves in only one direction. For example, the marketing department may want to monitor calls for a particular product in real time to judge the effects of targeted advertising. The order-processing system can pass data on that item to a stand-alone application that will analyze it from the marketer's point of view.

Applications that must be developed quickly are also good prospects for stand-alone treatment. A company I worked for not long ago experienced

Functions that are totally independent of day-to-day processing are prime candidates for stand-alone treatment.

rapid growth and sold many products in a short time. Unavoidably, there were a good number of customer returns, and no way of tracking them. We rapidly developed a microcomputer application that kept track of when a customer called, when we owed him or her a reply, and the final disposition of the matter.

This is not to say that stand-alone systems should be "quick-and-dirty" solutions. No matter how independent an application is when it's built, it's very likely that integration will be necessary or highly desirable at a later date. Foresight during development helps ease any eventual integration. The database administrator should help with the stand-alone system's design to ensure that its data structure will mesh with the organization's long-term information strategy. Regular development and documentation standards should apply to guarantee easy maintenance. You might try out fourth-generation languages and other new-development technologies on stand-alone systems. But it's important to make sure that the application provides a good path to existing systems.

My experience at a large manufacturer that decentralized data processing while trying to put up a new manufacturing system demonstrates the benefits of the stand-alone approach. Corporate MIS/dp had been performing yearly calculations to determine standard costs for the parts and products manufactured by its various plants. Under decentralization, that responsibility fell to the individual factories. The software that corporate headquarters had been using for calculating standard costs was incompatible with the equipment in the plant so we had to find our own solution.

The situation was complicated by our planned move to a new manufacturing system. Logically, costing would have been an integrated part of that system, but it was not going to be com-

pleted in time for the annual standard-cost review. There seemed little point in integrating costing with our existing system, which was slated to disappear.

We elected to build a stand-alone standard costing application. We drew on logic available in the documentation for corporate MIS/dp's costing software. The database administrator designed the information's structure to mesh with either the old or new manufacturing systems. And we wrote clear input and output paths to and from the existing system.

The designing went very quickly because the users and developers were able to concentrate on just one application, rather than dealing with its effect on the entire system. We took this opportunity to break in a new programmer analyst who participated in all phases of development and quickly came up to speed. We also successfully experimented with a fourth-generation report writer.

We wrapped up the project a month ahead of schedule. Testing went smoothly because we didn't have to check a more complex, integrated system. In fact, the application worked the first time. Later, when the new manufacturing-system project died, we were able to link the standard costing application back to the existing system with a simple, one-time data exchange.

The situation for the costing application was perfect for stand-alone development. The function was separate from the main processing. Input and output were limited and well defined. Our users understood the process and were happy with it, and management was willing to endorse the approach to increase the chances of getting the project done on time. And planning by the database administrator allowed us to cover several bases for later integration. Finally, the problem did not require a complicated solution, proving that the simplest solution is usually the best.

(Continued on page 60)

A simple interface limits the risk to existing systems.

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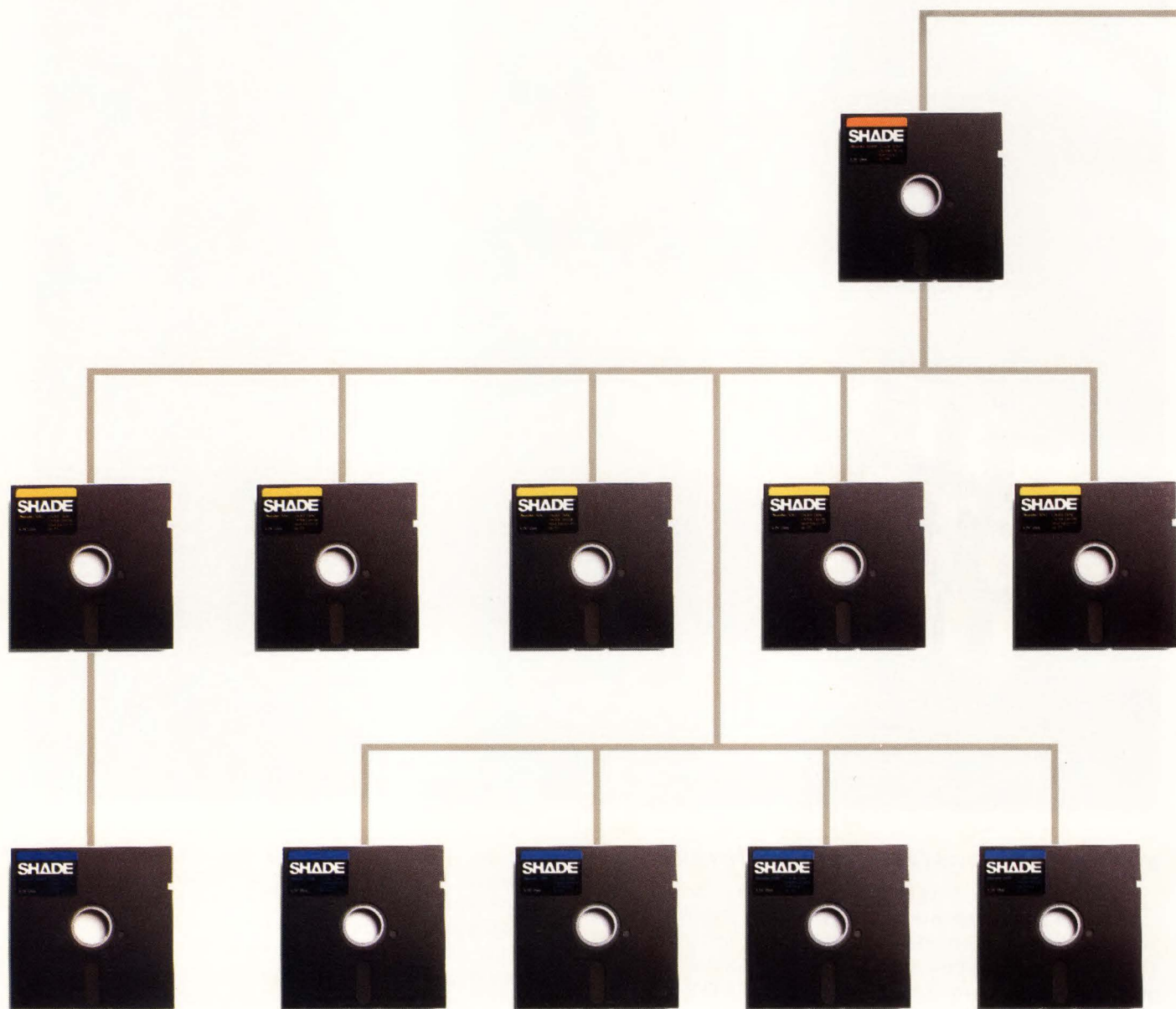
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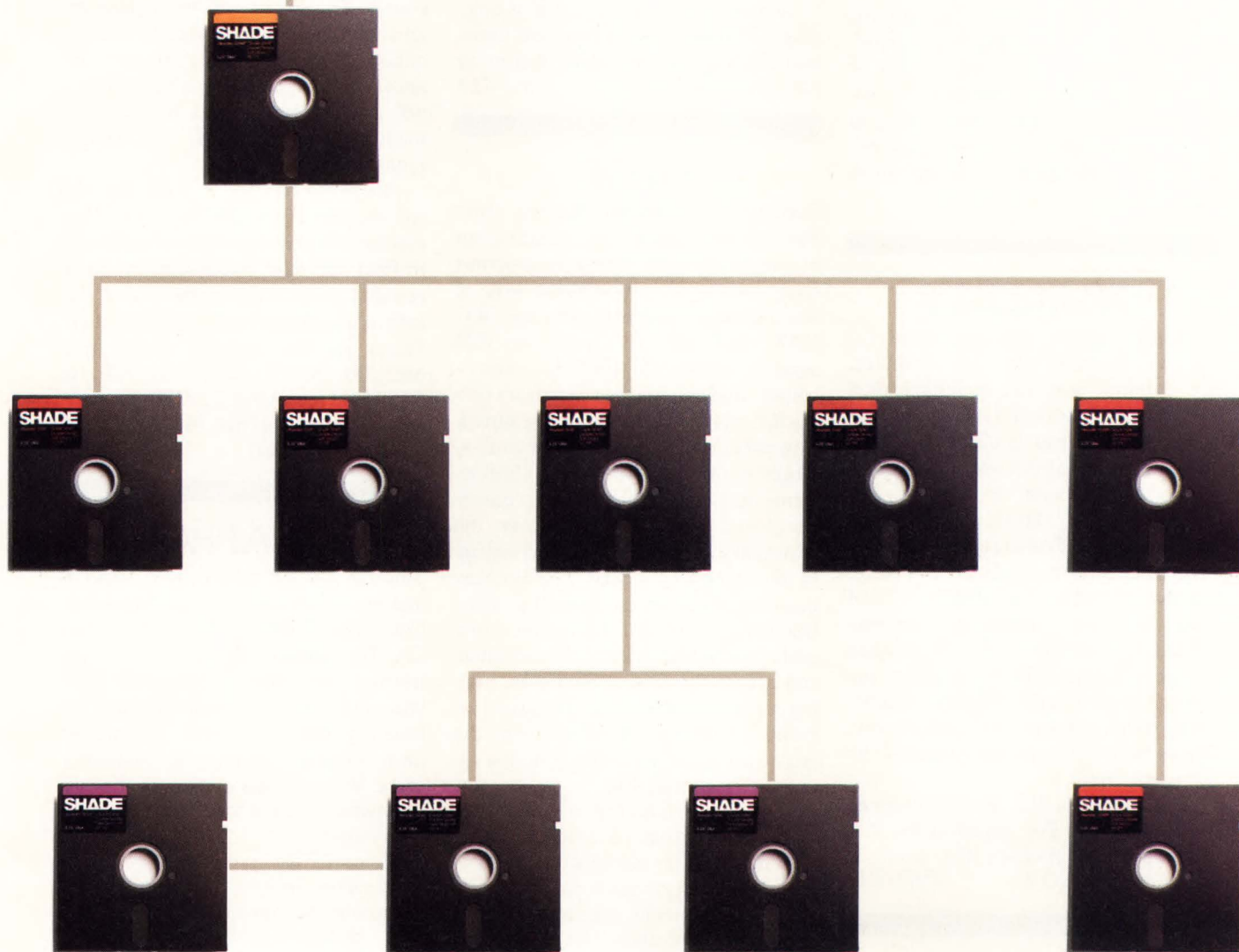
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CIRCLE 33



(Continued from page 56)

AUTOMATED EXECUTIVE

Corporations that want to integrate decision-makers into their information systems often face a formidable obstacle: reluctant executives. Executives that have barred terminals and personal computers from their offices usually offer two explanations: The systems don't provide meaningful help for performing their jobs, or the trouble of learning to use them outweighs the benefits. Developers have been trying to provide systems that answer those objections. These are some recent developments:

INTELLECT

Although menus and icons ease the user's interaction with the computer, it's doubtful that any communication will be easier than natural English. Intellect from Artificial Intelligence Corp., Waltham, MA, allows users to query a range of databases in English. The product offers direct interfaces to Adabase from Software AG, Reston, VA, IDMS from Cullinet Software, Westwood, MA, and IBM's VSAM files. Artificial Intelligence recently added an interface to Information Builders' Focus. With the product, the user asks an English question of Intellect, which creates a Focus query. Focus then retrieves and displays the requested data.

Intellect with the Focus interface costs \$30,000. For organizations that already have Intellect, the interface alone costs \$15,000. *Circle 215*

EZNOMAD

Like most fourth-generation languages, Nomad2 from D&B Computing Services, Wilton, CT, provides powerful application-development facilities for those willing to learn the syntax. That takes time and practice, which many executives won't or can't invest. To make the system accessible to the novice or infrequent user, D&B recently developed EZNomad. The package provides English prompts, menus, and

fill-in-the-blank screens that allow access to Nomad2's database-development and maintenance, report writing, and time-series arrays. There's no need to learn the fourth-generation syntax, although EZNomad will help teach it with online tutorials and by walking the user through applications as they're developed.

Beginning this month, D&B is shipping EZNomad free to Nomad2 users, and offering it as a standard feature for new purchasers. *Circle 414*

PILOT

Executive Information System from Pilot (Boston), relies on a combination of mainframe and personal-computer components. The mainframe side of the package—available now for DEC VAX minis with a version for IBM systems under VM/CMS to come—collects and summarizes data from production systems and external sources. The personal-computer components—which require an IBM PC with 256K internal memory, a high resolution graphics board, and mouse—deliver the information and processing technology to the executive's desk. Communications components on both the mainframe and personal computers automate dialing and log-in so the executive can access the system simply by turning on his or her machine. Password security is available, by either typing the password in, or by reading from the executive's personal disk.

The key mainframe component is the Pilot database, a relational database designed for manipulation of time-series data, high-speed data aggregation, and automatic preaggregation of frequently used data. This design provides rapid response for requested applications and data. Information from production files, extracted by systems such as Focus from Information Builders Inc., New York, and Ramis from Mathematica Inc., Princeton, NJ, or a user-developed interface, and from external databases, such as the Dow Jones News Service, Princeton, NJ, and Chase Econometrics, Waltham, MA, enters the Pilot database via a data-import module. Usually, updating is done in batch during off-hours. It can

also be done as a low-priority background task.

The user interacts with the system using a mouse and a series of menus. A user can build simple applications via the menus or use applications that come with Pilot. Typical applications produce standard financial reports, analyze sales, and compare plans with events. The system will track performance factors that the executive deems critical to success, and point out variances from expected performance. It will present results and reports in a mixture of text, tables, and various types of graphs.

According to Pilot, a VAX 11/750 will support about 20 Pilot users. That machine does not have to be dedicated to Pilot, although the system probably couldn't share a computer of that size with a production processing system. Prices for the software range from \$50,000 for a VAX 11/730 to \$100,000 for a VAX 11/780. The pre-release price for the IBM VM/CMS version is \$90,000. *Circle 412*

METAPHOR

Another new system aimed at decision makers is Metaphor from Metaphor Computer Systems, Mountain View, CA. The system provides a tool for extracting data from a corporate database and hardware for storing and distributing that data and information from external sources to Metaphor users. Workstations come with the system, which is held together by a local-area network.

Metaphor also provides applications and facilities directed at sharply defined corporate job functions. For this reason, high-level executives may not find it particularly useful. Targeted applications include finance and marketing functions for large consumer packaged-goods retailers and commercial banks and financial planning and control operations for Fortune 500 manufacturers.

The user interacts with the system using a mouse to select icons representing procedures and applications. An eight-user system sells for \$64,000. Workstations, up to a maximum of 32, can be added for \$4,000 each.

Circle 413

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DATA COMMUNICATIONS

by John Seaman, Data Communications Editor

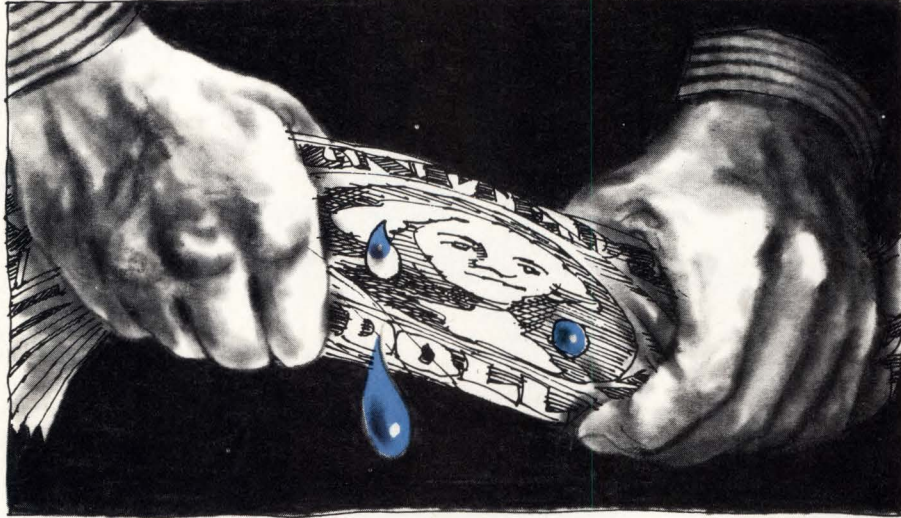


Illustration by Dan Culhane

COMPRESSING DATA-COMM COSTS

Is your company running out of capacity on the leased lines used in distributed data-processing applications—just when you may have to wait four to six months for more dedicated lines? Are your order entry, inventory, and other ddp applications grinding to a halt? How can you increase capacity without increasing costs?

Many corporations are trying to resolve these problems by ordering multiplexers and concentrators to combine many input data streams into one high-speed link. Eventually, however, the single composite, or trunk, line will reach capacity. There is another solution. Instead of paying for new, higher-capacity lines (if you can get them), use the leased lines you already have more efficiently through data compression. Some users are halving their line costs by compressing data: One 9,600-bps line can carry the same amount of data that previously required two (or more) lines.

Payback periods of six to eight months for data-compression equipment are common. Because the slow-speed lines require less costly, slow-speed modems, users can also save on modems. Data compression has been successfully used in telemetry, television-signal processing, facsimile processing, and in some multiplexers. But the new data-compression devices are built expressly to compress data transmissions used in distributed data-processing (ddp) applications. These data compressors employ sophisticated algorithms to recognize and condense recurring patterns in transmitted data.

Most data-compression units available to users today claim to reduce bandwidth requirements by at least 50 percent. This means that a unit receives a data stream at 19,200 bits per second (bps) and sends it as a 9,600-bps transmission.

Users must decide which data-compression technique is right for them. Randy Huston, marketing direc-

tor at Nokia-Kinex (Largo, FL), a data-compressor vendor, says, "There are several data-compression techniques available. Some are generally better than others, and some are better at specific applications. It's not like buying a V.29 modem, where you just buy the device from any vendor and plug it in. You have to customize."

Some users choose stand-alone data compressors. Most of these are manufactured by only a few startup vendors. At \$500 or \$1,500, each unit represents a small expense, but when purchased in quantity, data compressors can lead to major savings. Other users opt for data-compression features in a major piece of hardware, a network processor that may compress 100 or more incoming lines and perform other network chores at the same time.

Which is the better choice? Codex (Mansfield, MA) makes several products that incorporate data-compression features. John Pugh, vice president of

(Continued on page 66)

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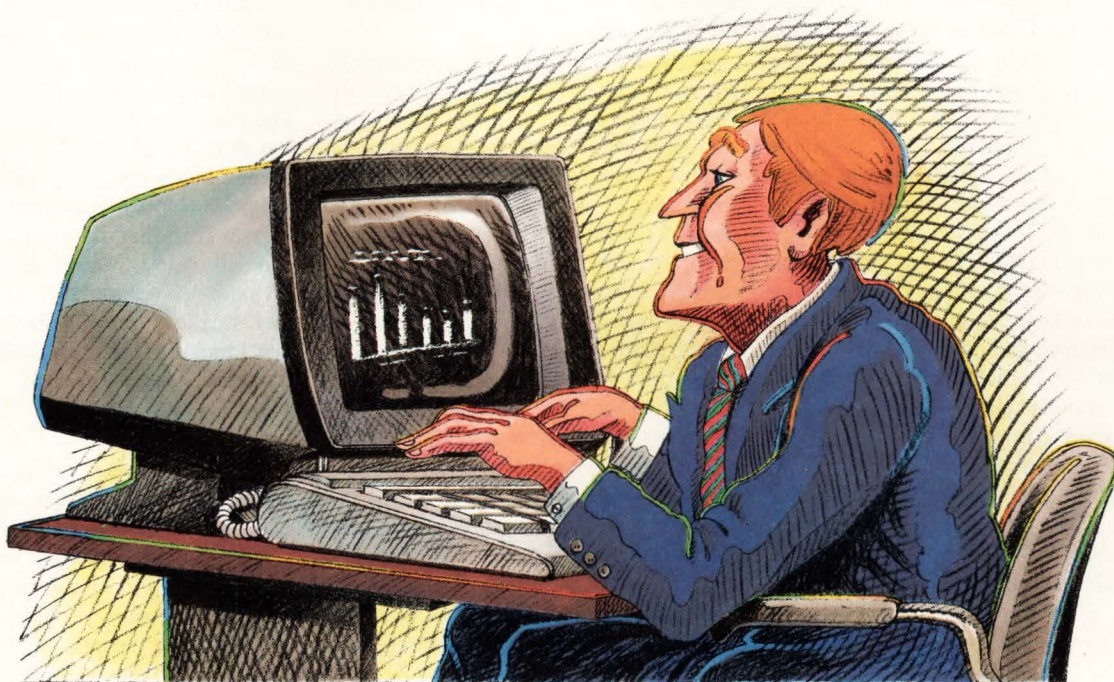
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(Continued from page 62)

corporate marketing, says, "Users want more bits per second. Instead of using a stand-alone data compressor, it may be more cost-effective for a small organization to use a high-speed modem and run it as fast as it will go. That's the way to get the most out of a line." Codex' Intelligent Network Processor (INP) 6030 performs statistical multiplexing, data compression, error control, and several other operations on up to 100 9,600-bps and faster channels. The INP 6030 costs about \$30,000 in a 100-line configuration and uses fixed (standard or custom) compression tables to identify patterns.

Codex' larger Distributed Network Processor (DNP) 6050 uses a dynamic compression table, which changes during operation to most efficiently use the changing relative frequencies of patterns in data transmissions. The DNP 6050 can handle up to 200 lines of high-speed data. It costs about \$70,000.

Pugh believes that, in the long run, integrated data-compression products will be more useful than the stand-alone units. "In five or 10 years, long-haul line costs will be much lower, thanks to fiberoptics, microwave, and satellites," he says. "It may not be worthwhile to use data compression unless it's part of a larger operation." Pugh advises, "Make sure you get the most efficient data-compression equipment you can find. Keep in mind that a statistical multiplexer may be able to perform all the data compression you need." A stat mux can be considered a type of data compressor because it eliminates blank, or "white," space in data transmissions. It does not, however, compress data by using a coded table.

Some users will choose stand-alone data compressors, either because they cost less or because they make possible more flexible installations. Users should consider the combination of input and output speeds when selecting a stand-alone data compressor. Chung Telecommunications' (Palo Alto, CA) Turbomux (\$550) and Turbomux-2 (\$750) data compressors can each compress a 2,400-bps data stream into a 1,200-bps transmission. The Nokia-Kinex Comdec can compress a 19,200-bps channel into a single 9,600-

Payback periods of six to eight months for data-compression equipment are common.

bps channel, and the Symplex (Ann Arbor, MI) Datamizer can compress at least two 9,600-bps lines into a single 9,600-bps output.

When selecting a stand-alone data compressor, users should also consider the unit's ability to operate on dialup lines, a necessity for smaller operations, like branch offices, that do not have enough data traffic to warrant leased lines. Glen Bream, president of Systems Control Group Inc. (SCG) of Miami, FL, can speak as both a systems integrator and an end user. He uses a Chung Turbomux in-house and has placed 70 units with a client who has large order-entry needs.

"We had some initial problems in the order-entry application with protocol conflicts that the Turbomuxes couldn't handle, but by working with Chung, we were able to resolve our difficulties," Bream says. Some data compressors will work on data formatted in any protocol. Other units will handle data only in a single protocol, such as bisynchronous protocol.

Symplex produces a data compressor that handles virtually all protocols. Nokia-Kinex' basic Comdec unit operates only with bisynchronous protocol. Multi-function capability runs up the price tag: The Nokia-Kinex Comdec costs \$1,500, but the more versatile Symplex Datamizer costs \$4,950.

RCA's corporate headquarters in Cherry Hill, NJ, uses Datamizers in its Somerville, NJ, data center to compress data formatted in several different synchronous protocols. Fred Goepfert, data-communications evaluations and tactical-planning manager, says "The Datamizer has given us the capability to handle throughput adequate to our needs over one 9,600-bps line."

Goepfert's Datamizer uses four lines to compress incoming order-entry and

inventory-control transmissions from a manufacturing facility in the Far East. The lines include three 9,600-bps lines and one 4,800-bps line, all synchronous. This is compressed onto one 9,600-bps aggregate line. Goepfert says, "We don't save money by using data compressors; rather, we avoid costs. Without the Datamizer, we would have to install at least one more 9,600-bps line. I estimate that the payback period for our pair of Datamizers (one local, one remote) was less than two months."

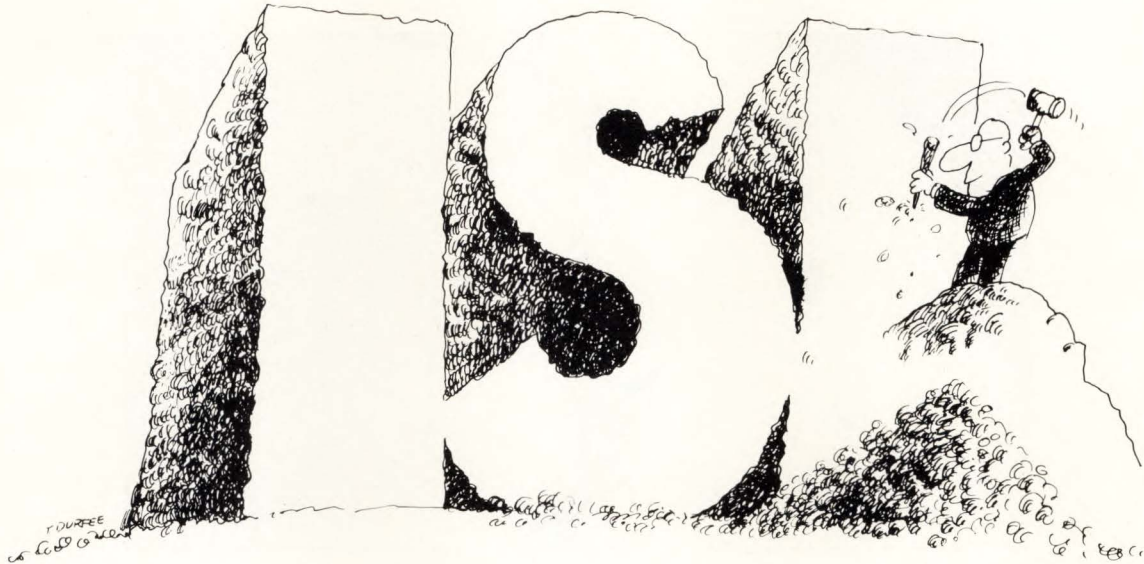
Another consideration is device integration. Even the stand-alone data compressors offer some integration. Users must decide if the integration offered by a stand-alone unit is sufficient or if they need a data compressor with an integral modem and/or mux. Every Symplex unit contains a mux. Nokia-Kinex offers modems, data compressors, and combinations of the two, but not muxes. Some vendors believe multiplexing should be tied in with data compression; others say it should be handled separately. What you choose will depend on your organization's requirements.

Finally, users must evaluate vendor viability. Most vendors already offering data-compression products are startup companies, and a new manufacturer may fail, leaving users without service or support. Be cautious.

Meanwhile, users are pressuring established data-comm hardware vendors to produce data-compression equipment. Infotron (Cherry Hill, NJ) and Paradyne (Largo, FL) are developing data-compression products. Racal-Vadic (Sunnyvale, CA) offers the four-channel input Scotsman III. John Curran, product manager for the Scotsman III, says, "Many users are operating their equipment at maximum transmission capacity, but they would like to send much more data. We offer them an easy, practical way to do that." The Scotsman III sells for \$6,000.

In many cases, data compression can save half your line costs. If you choose your data-compression equipment well and cautiously, you can solve some of your organization's major data-transmission problems and save money in the bargain. □

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FOLLOWING THE LEADERS

by Michael D. Millikin



Photo by Ewing Galloway

SPERRY: BIG BLUES?

IBM's success in the personal-computer market has helped spark an explosion in distributed processing and is forcing its mainframe competitors to piece together a similarly diverse product line. For Sperry, which is primarily a mainframe manufacturer, IBM's success with both micros and mainframes has been a particularly threatening combination. Big Blue's move to micros has placed the smaller and, as many analysts thought, enfeebled Sperry, more directly in competition with IBM.

Or so it seemed. But, after a struggle, Sperry has regained its footing, largely due to the complete restructuring and revitalization of its old data-processing department. Joseph J. Kroger, president of the department, which is now known as Information Systems, contributed to a 29 percent rise in operating profits during the first quarter of 1984. And although the division reported a 6 per-

cent drop in operating profits for the second quarter (ending September 30), revenues increased 8 percent. Sperry attributes the recent drop in revenues to the continued strength of the U.S. dollar overseas and to increased research-and-development expenditures. Dewaine L. Osman, vice president of the marketing division of Sperry Information Systems, says shipments are accelerating. Orders in the last three months are up 28 percent.

Kroger has also tried to streamline his department and increase the company's awareness of the demands of the market. One step was to eliminate separate marketing heads. Now, all three marketing departments report directly to Kroger. Another measure was to shift the balance of power from the engineers to the marketing executives.

Corporate headquarters has also contributed to Sperry's upswing. The New York office greatly reduced the

corporation's short-term debt, now that Sperry has ceased to act as its own leasing company. "We got out of the banking business," says Osman. Today, 75 percent of sales are cash.

These tactics have resulted in a heavy push to produce a full family of products, from desk-top computers to mainframes. Sperry is determined to change its own product mix to compete in the micro market. "We'd like to see mainframes drop to around one-third of our revenues," says Osman. Currently, more than 50 percent of Sperry's gross revenues come from mainframe sales.

Despite the drive to develop a competitive product line, Sperry is still basically a mainframe manufacturer. The company plans to follow through on its 1100 series, while relying heavily on research and development to continue to provide more powerful small and mid-size mainframes.

Sperry pumped \$40 million into

(Continued on page 72)



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(Continued from page 68)

Gene Amdahl's Trilogy (Amdahl's first big flop) in an attempt to leap forward on the development of follow-on chips and processors for the 1100 family. Despite the failure of Trilogy, which forced Sperry to write down \$32.6 million of its investment, Osman insists that Sperry gained useful technology.

More promising, according to Thomas Crotty, an analyst for the Gartner Group (Stamford, CT), is the work Sperry is doing with CMOS high-density chips for mainframes. "Sperry is counting on CMOS as the technology of choice in implementing its product strategies," says Crotty. "CMOS holds promise as a technology for mainframes."

To protect itself from IBM, Sperry plans to strengthen its hold on some of its select niches in the general mainframe market. These include: the Bell operating companies (such as Nynex and Southwestern Bell); manufacturers (Sperry just released a Computer Integrated Manufacturing/Mechanical Engineering (CIM/ME) system that handles all the steps from product design to manufacturing); energy suppliers, and government agencies.

But can Sperry compete with IBM's broad range of products? Sperry's trying—Sperrylink, its office-automation offering, appeared in 1982; the Sperry PC, an IBM PC clone made by Mitsubishi, was released in 1984; and the Mapper 10 and Mapper 5 decision-support systems appeared in 1983 and 1984, respectively.

Mapper, which was developed for in-house use, has proved to be one of Sperry's more popular new products. Mapper 5 is Mapper on a chip: micro-processor-based, desk-top workstations that provide data integration among Mapper Sperry 1100 files. (Mapper 6, which will connect IBM

hosts, has been delayed.)

An incomplete product line is not the only roadblock Sperry must overcome. Sperry's personal computer still can't hook up to Sperrylink, either singly or in networked clusters. A Mapper 5 cluster can't link up to a Sperrylink installation without going through a Mapper 10 controller box. And, perhaps most devastating of all, Sperry's micros still can't plug in and play in an IBM environment. But these hurdles will all be overcome, says Osman. Products are being developed that will hook personal computers to Sperrylink and allow desktops—including IBM PCs—to run Mapper.

To yield a thoroughly transparent user interface, Sperry is working on shrinking the 1100 operating system down to a chip for implementation in personal computers. To supply compatibility in a multi-vendor environment, says Osman, Sperry is also standardizing on MS-DOS and Unix.

Sperry has been trying to build up its micro division by assembling a broad stable of Unix-based products from various other vendors. Reliance on third parties is a radical change for a corporation that has always developed and produced its own products. Although Sperry is pumping more money into research and development, it recognizes that to respond quickly to a broad and volatile market, it must take advantage of what other vendors have to offer.

In such cases, Sperry will become more of a system integrator than a vendor. Sperry is indulging in several joint ventures, for both hardware and software. "We are aggressively working with third-party vendors and developers," says Osman. "If we were doing things the old way, we would have developed and built everything ourselves, but by the time the product was released, it would have been too late."

"We'd like to see mainframes drop to around one-third of our revenue."

Osman, Sperry

Despite its progress, Sperry still faces both external and internal obstacles. It must overcome its history of lateness and meet its follow-on schedule for the 1100 mainframe. And Sperry's Unix foray could flop if third-party developers don't come up with enough applications software. Sperry must also shed its stodgy image—too many corporations still think of it as merely a mainframe manufacturer.

Sperry is gaining strength as it struggles for its place in a highly competitive industry. But what Sperry needs most of all is time—time to develop its new mainframes, time to plug the gaps in its product line, time to integrate and balance its mainframes and micros.

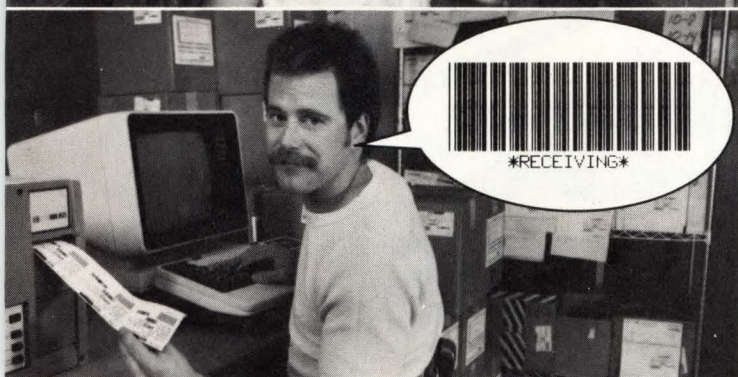
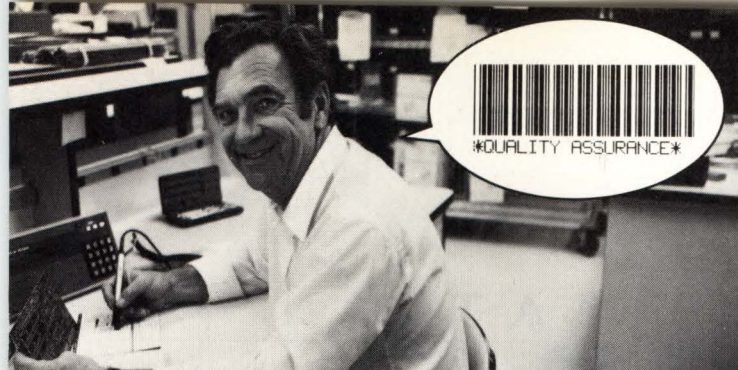
Fortunately for Sperry, a gigantic federal contract is buying that time. "Sperry has a cushion," says Crotty. "The business Sperry derived from the government in 1983 will allow it to keep plants open and employment up as it fulfills the contracts. It might not be hugely profitable, but it gives Sperry something to fall back on."

"Sperry can't change overnight," adds Crotty. "You go with what brings in the revenue. A high-end processor will help stem the tide of losses until Sperry can reach a desirable position. But it will take time—probably 10 years—before we will see a meaningful shift [in Sperry's product mix]."

But Dewaine Osman sets his sights on the present rather than the future. "We're not concerned with being a strong force in the commercial computer business," Osman says. "We expect high profits, good growth, and an excellent new year." □

Michael Millikin is a writer and consultant based in Boston.

"Sperry is standardizing on MS-DOS and Unix, in addition to maintaining a top priority to interconnect with IBM."



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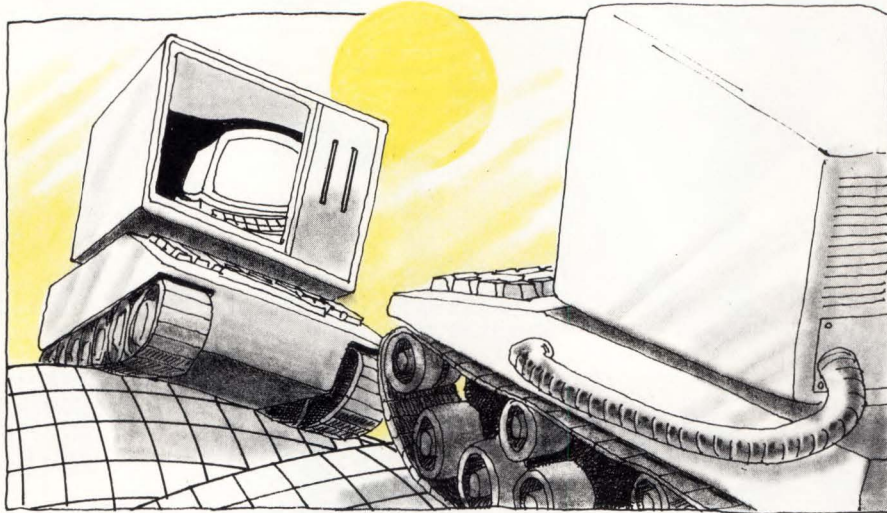
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OFFICE AUTOMATION

by Miriam Lacob



SURVIVORS OF 1990

A battle for vendor survival—with stakes in the billions of dollars—is raging among office-automation vendors. And office-automation managers, who invest hundreds of thousands of their organizations' dollars in computer equipment, need to target—and avoid—the future casualties of the computer industry. So, ensuring that a vendor will provide long-term service, system upgrades, and hardware compatibility has become as important as rating the excellence of a product or system.

Three years ago, *Computer Decisions* launched an annual survey to help forecast the future of well-known OA vendors, in cooperation with the Office Automation Society International. This year, 75 office-automation consultants and managers of OA projects were asked which vendors will be survivors in five years' time. In 1982, 22 experts responded; in 1983, 36; and in 1984, 33 experts responded.

Respondents were asked to predict

the survival probabilities of 39 full-line vendors to Fortune 1,000 corporations. The experts were asked to check one of three ratings for each vendor named: "sure survivor," "likely survivor," and "not likely."

In tallying results, a score of 10 points was assigned to each sure-survivor vote, 6 points to each likely survivor vote, and 2 points to each not-likely vote. The chart accompanying this report provides the latest total scores for each vendor, the unit-number of sure-survivor votes each received, and its scores in the previous two annual surveys.

The finish of this year's top five vendors was predictable, with IBM comfortably occupying the top spot. All but two of the 33 respondents gave Big Blue a sure-survivor vote, recognizing that IBM continues to be unmatched in service, marketing muscle, and ability to change with the industry.

Spot number two, which was held last year by Digital Equipment Corp.

(DEC), Maynard, MA, is now occupied by AT&T Technologies, Morristown, NJ. Last year, AT&T came in fifth with 272 points—possibly a reflection of uncertainty about the future direction of the communications-and-research colossus.

This year's top ten has three new entrants and four dropouts. Rolm Corp., (Santa Clara, CA), Data General, (Westboro, MA), and Burroughs Corp. (Detroit) are new entrants, and the dropouts are Apple Computer (Cupertino, CA), Honeywell (Minneapolis), Sperry (Blue Bell, PA), and Northern Telecom (Richardson, TX). Although our experts' ratings preceded Rolm's September merger agreement with IBM, the news was already out that Big Blue was purchasing stock in the data-and telecommunications-equipment manufacturer.

Burroughs—in a back-seat position in the mainframe market—is widely perceived to be struggling back to life,

(Continued on page 78)

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**Sooner or
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this computer
problem.**

PC MAGAZINE • MAY 15, 1984

Do your eyes itch, burn, or tear? Are they tired and sore? Do you get headaches, occasional dizziness, or blurred or double vision? If you have any of these symptoms, you're probably suffering from eyestrain and fatigue, and it may be from using your PC.

Eye fatigue and other vision problems are common for regular users of PCs and other kinds of video computer displays. This visual stress can also contribute to general tension and tiredness. Fortunately, the vision problems experienced by video display users have

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Quite clearly, as PC Magazine spells out, that's not the only trouble they're having.

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Second, if computer users suffer, so does business.

Because computers are only as fast and accurate as the people who operate them.

You are not a machine.

Computers are designed by engineers.

They usually know a lot about technology but very little about people.

Which is why so many computers are technically impressive but strangely unnatural to use.

Computer-induced problems (%)	
Eye strain	55%
Back pain	43%
Headaches	30%
Shoulder	25%
Hand/wrist	18%
Neck pain	15%
(Source: "Ergonomic Principles in Office Automation" Pub. 1983 by E.I.S. AB, Sweden.)	

Ericsson, in its very Swedish way, has always believed that excellent ergonomic design isn't a privilege.

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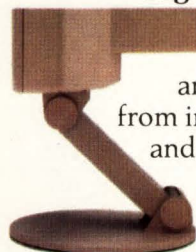
With restful amber characters on a specially developed, low-fatigue background color.

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You can even have characters and graphics on the same screen.

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Thousands of people get neck and muscle pain from inadequate height and angle adjustment. The Ericsson Ergo-Arm lets you move your screen exactly where you want it.

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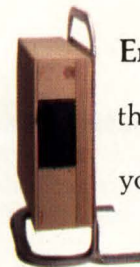
The keys are full-size and the layout is ergonomically planned for greater accuracy and speed.

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ERICSSON 

OFFICE AUTOMATION

(Continued from page 74)

led by Michael Blumenthal, former Secretary of the Treasury. In contrast, Northern Telecom, another telecommunications specialist, dropped to 11th place.

The survey responses reflect an overwhelming respect for reality. "Longevity will be based as much on depth of finances as on the quality of a product," wrote one respondent. "It costs a lot to play the game." □

Miriam Lacob is a free-lance writer based in New York City.

Next month: Supplying single-site organizations: Playing in the same ball park?

THE FORTUNE 1,000 SURVIVORS

Company	1990	SS Votes	Ranking	Last Survey	SS Votes	1982 Survey	SS Votes
AES Savin	90	0	31(tie)	-	-	-	-
Apple Computer	188	7	12(tie)	250	16	104	5
Anaconda-Ericson	66	1	34(tie)	74	0	-	-
Anderson Jacobson	136	5	23	124	3	52	1
AT&T Technologies	306	27	2	272	23	178	16
Bell & Howell	166	8	17	158	5	-	-
Burroughs	206	8	10	196	9	98	0
Canon	156	7	19	-	-	-	-
Computer Consoles	88	1	32	-	-	-	-
CPT	94	0	28	120	2	78	0
Data General	234	13	8	196	8	74	0
Datapoint	178	7	14	162	3	82	0
A.B. Dick	112	4	29	124	3	48	1
Digital Equipment	286	24	3	298	28	172	14
Exxon Office Syst.	126	4	26(tie)	160	8	44	0
Hewlett Packard	274	20	5	284	23	134	8
Honeywell	188	9	12(tie)	234	13	106	2
IBM	316	31	1	342	33	206	20
Kodak	226	16	9	220	16	-	-
Lanier (Harris)	132	3	24	172	17	90	2
Motorola (Four Phase)	146	2	22	134	6	74	1
NBI	150	3	20	120	4	92	1
NEC Information Syst.	176	4	15	144	9	70	0
Nixdorf	90	1	31(tie)	72	1	46	0
Northern Telecom	196	9	11	206	14	102	5
Olivetti	126	3	26(tie)	112	3	72	1
Philips (Micom)	92	0	30(tie)	110	6	78	0
Prime Computer	148	3	21	152	5	80	2
Rolm	244	16	7	152	8	98	4
Royal	76	0	33	106	3	46	0
Sony	130	2	25	162	8	70	1
Sperry	174	10	16	196	11	84	0
Syntrex	92	0	30(tie)	78	1	48	0
Tandem	158	8	18	142	4	80	0
Tandy (Radio Shack)	118	1	27	160	5	70	3
3M	184	10	13	190	12	-	-
Wang	278	22	4	288	25	194	17
Wordplex	66	0	34(tie)	60	1	38	0
Xerox	250	17	6	244	18	164	11

The ratings of Fortune 1,000 vendor-survivors are based on responses from OA experts asked to predict which OA vendors will still be in the game in five years. Scores in the year columns indicate the cumulative tallies for each vendor of sure-survivor votes (10 points), likely survivor votes (6 points), and not-likely votes (2 points).

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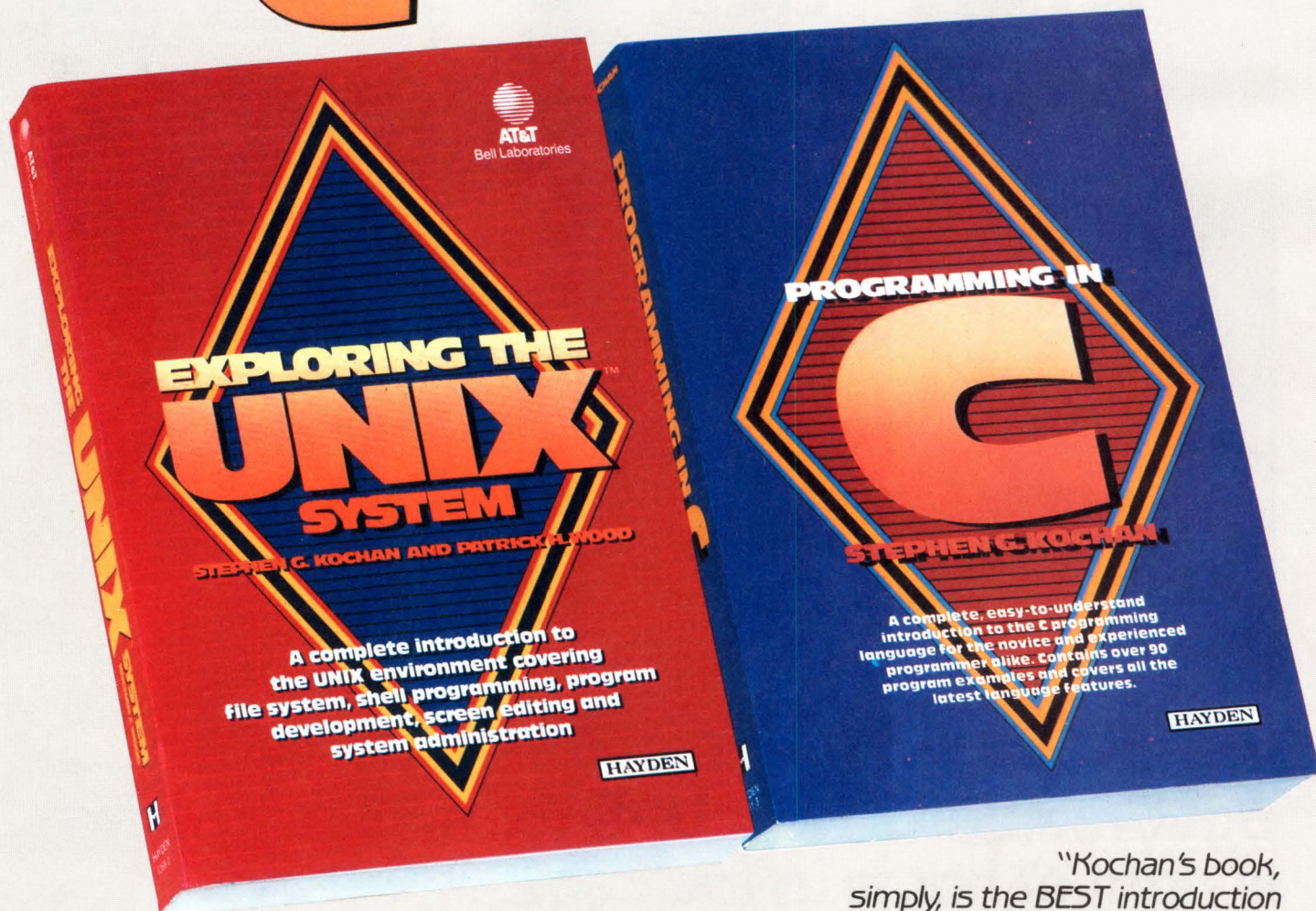
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OUTSTANDING DATA CENTER

by Theresa Conlon, New Products Editor

FIRST INTERSTATE LOS ANGELES, CA



Photos by Pierre Kopp

First Interstate Bank of California (Los Angeles) has a secret. It has managed to hide an entire computer facility by building it underground.

From the outside, only the 10-story administrative building is visible. Below, the underground facility, a second structure that is three times larger than the exposed building, allows for an assembly-line work flow. It consists of three floors, each 150,000 square feet. This area contains the country's largest cash vault, which is 40,000 square feet. The entire underground facility has high security and low access.

Originally, First Interstate's management planned to build two 10-story buildings on the same site, each with a



First Interstate Bank of California of Los Angeles (top). A heliport (above), located on the bank's roof, is used for 15 daily helicopter runs that speed deliveries to local airports where they are then routed to eastern banks.

50,000 square-foot floor print. One building would have been devoted to administrative and clerical work and the other to production and operations.

Gottfried Consultants Inc. (GCI), a facilities-planning consultancy based in Los Angeles, advised that, for this bank, designing a two-building facility would be unwise. "We pointed out that the check-processing work flow would run more efficiently in a horizontal layout," says Philip Wein, vice president of GCI.

Wein continues, "Banking is a very paper-oriented business, and First Interstate Bank processes several million checks a night in its operations center. Many banks are handling this type of extensive paper flow in urban areas

OUTSTANDING



The network-control telecommunications room (above) connects First Interstate's 200 bank branches in California. Throughout the building, there are several thousand IBM 3200 series terminals that are also connected to the telecommunications network. Data are transmitted by microwave and satellite technology.

where they may have 300,000 to 400,000 square feet of operation space stretched over 10-story high rises."

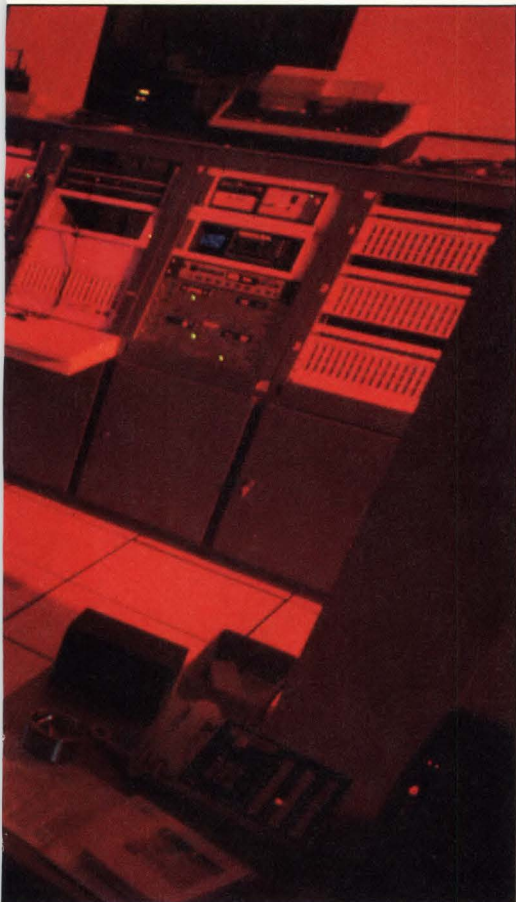
Space limitations in urban areas make horizontal layouts difficult to achieve. They are usually built in suburban areas where there is enough land to spread out a building. First Interstate solved this by buying out about 15 individually owned land parcels in a redevelopment area. The bank constructed a smaller number of floors with larger dimensions. For example, instead of having 10 floors that take up 50,000 square feet, First Interstate has 3 floors of 150,000 square feet. With this setup, checks don't have to be transported from one operation to another as much, and that means fewer errors.

GCI's architectural plan helped the

(Continued on page 86)



DATA CENTER



First Interstate's data center's array of advanced features include a computerized mail system (below). A conveyor belt delivers the mail to the various office departments. Office workers drop outgoing mail onto the conveyor belt, which delivers it to the mail room.



The disk-drive area (left) has 300 IBM 3350 disk drives and an equal number of sophisticated IBM 3380 disk drives.

The carousel (left) is the last section of the bank's conveyor system. Checks are dropped onto the conveyor belt by operators who turn handwritten checks into machine-readable code. The supervisor at the carousel collects the checks and reroutes them.



Console control-center operators monitor IBM 3083 and 3081 mainframes (above). Only 12 employees have access to this area, which has the tightest security in the building.

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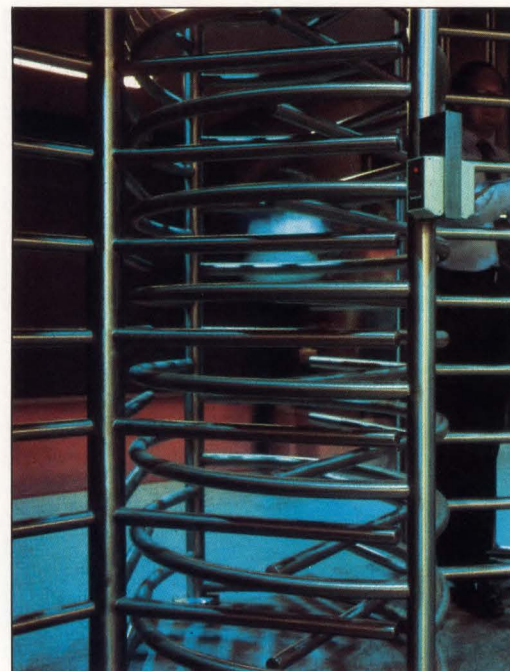
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Perey Turnstiles
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DATA CENTER



Gottfried Consultants has designed the building to accommodate an assembly-line work flow (below). An underground conveyor system, manufactured by Jervis Webb, can circulate checks between stations in about three minutes.



Philip Wangelin (left) is the center manager of production services at First Interstate Bank of California.

Perey "high-bay" turnstiles (left), located in the operations center, are activated by a card-access system. Other high-security areas in the computer center incorporate biometric locks that respond to voice and fingerprint. Honeywell designed the bank's entire security system.

OUTSTANDING DATA CENTER



A bullet-resistant, glass-enclosed guard station (left) is located at the entrance of the computer room. A small room known as a man-trap is located alongside the guard station. It provides further security by barring more than one person from entering at a time from the computer room.

An IBM 3890 reader/sorter (below) takes a microfilm photograph of each of the millions of checks the bank receives each day. The reader/sorter captures information for the bank's mainframes, then spits the check out, sorting it into the appropriate check-size pocket.



(Continued from page 83)

bank determine its processing strategy. The end result: a 13-story, 767,000-square-foot operations center with state-of-the-art equipment that is 10 times the size of First Interstate's old facilities.

Now one of the largest computer centers in the Los Angeles area, First Interstate also boasts that it houses the fifth largest check-processing facility in the country. Around \$30 billion in checks, global-funds transfer, and remittance banking are processed by the center each day.

The data center's array of features include a robotized mail service, security systems that recognize fingerprints and voices, and an underfloor conveyor



Coreplex (above) is a check-repair system manufactured by BancTec. It repairs machine-readable code on damaged personal checks so they can be read by Interstate's computer system.

system that speeds work flow.

The center was completely finished and occupied in February of 1984. The architect was Langdon, Wilson and Mumper of Los Angeles. The general contractor was Turner Construction of (Los Angeles), Levin and Seegel (Los Angeles) were the electrical and mechanical consultants, and Widelitz & Associates (Los Angeles) was the project consultancy.

The building's power is supplied via two separate 34,000-volt lines. If there is a break in power, the critical equipment in the computer room can be run by battery power, supplied by Tele-dyne Inet. Within 10 seconds, the five 1,000-kilowatt diesel generators will take over. □

Ken Widmaier
Director, Operations and Development



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STALLING FOR SUCCESS

*In the looking-glass world of corporate life,
sometimes stalling is the best course of
inaction.*

by Edward P. Stevenson

To paraphrase an old adage: To dawdle is human; to act, sublime. The more straightforwardly we deal with matters, the more we can accomplish; the less we are encumbered by unfulfilled duties and obligations, the more fully we respond to the demands of the present. Yet, according to psychologists, the tendency to procrastinate—to evade the strenuous, the onerous, or the unpleasant—is all too common. For this and other reasons, the traits of decisiveness, efficiency, and responsiveness are highly prized in the corporate work ethic. Decisiveness is certainly among the most sought-after qualities in those who aspire to the exalted ranks of management.

Or so we're told. We've all encountered bosses who seem entirely lacking in these prized characteristics—bosses from whom you're more likely to get a

large cash loan than a firm decision. Who has not had to deal with an executive who seems immune to the natural human tendency to accomplish work, however slowly? These executives are familiar figures: the classic equivocators, wafflers, procrastinators, evaders, or—to use the baldest term of all—stallers.

Stalling is not quite as inimical to business success as logic—or popular wisdom—suggests. On the other hand, it is invariably irritating, frustrating, and disruptive to deal with. Does managerial stalling have a legitimate role in business? Ethically? Tactically? Is it a useful weapon in the managerial arsenal—or a cover-up for executive incompetence?

The opinions of data-processing and information-systems executives and management consultants run the gamut from condemnation to approbation. A veteran dp manager of a large, private-



Photo by Rick Barrick



STALLING

ly held New York brokerage house, for example, disapproves of stalling in no uncertain terms. He hasn't achieved the position of reporting directly to the head of the firm by stalling, he says, and he won't tolerate procrastination in his staff. Anyone in his department caught stalling will be shown the shortest path to the door. At the other extreme, the executive vice president in charge of information systems at another New York financial house seemed surprised at the naivete of the suggestion that stalling wasn't a legitimate strategy.

In its mildest manifestation, executive stalling can be described as "benign neglect." This policy—that managerial action is not necessary every time a problem is raised or a complaint is voiced—has many adherents. The most concise version of the principle is: "Ignore a problem long enough, and it may go away." Or, as Gerald Hoffman, manager of special projects at Standard Oil of Indiana (Chicago) puts it: "A good way to get perspective on managerial priorities is to take your daily list of things to do and put it in a drawer for a week. When you take the list out, many of the priorities will have disappeared without your doing anything."

Considering most managers' workloads, this "energy-saving" tactic may seem to be reasonable and prudent. Is it stalling? That's largely a matter of interpretation. Benign neglect can be wisely used, or it can be abused. Many managers who employ it emphasize the element of choice and point out that neglect is a deferral of action, not an abdication of responsibility.

E. Nancy Markle, vice president of information systems at the Federal National Mortgage Association (Fanny Mae) in Washington, doesn't believe in stalling, but she says inaction can sometimes be a productive tactic. "I can often judge that a problem will resolve itself over time—or at least that it doesn't require my immediate intervention. But I don't stall," she asserts. "I



E. Nancy Markle, vice president of information systems at FNMA, says inaction can be a productive tactic.

make a deliberate decision to let the matter rest." Clearly, this is a matter of semantics.

Legitimate stalling takes many other forms, say proponents and experts. Victor Millar, a managing partner at Arthur Andersen & Co. (Chicago), cites "instructive" stalling. In this situation, a senior executive is unresponsive to requests for decisions from subordinates, throwing back at them decisions they should make but, because of their inexperience, are hesitant to tackle.

Paul Giese of the information-technology consulting arm of Arthur D. Little Inc. in Cambridge, MA, advises "creative stalling" in several common dp situations. "When purchasing equipment," says Giese, "it's often better to delay a decision as long as possible. You can use the time to refine your needs and take advantage of technical improvements. It's rare that price quotes go up while you're negotiating with sales reps."

Creative stalling will also help ease the pressure when legitimate requests for resources can't be filled because annual budgets have been spent or allo-

cated; when sufficient facts are not available to make fully informed decisions; or when the manager can't disclose confidential information that affects the decision or request, says Giese.

Managers who consider themselves nonstallers dispute these points. Scott Dryberg, vice president of information systems at A.O. Smith Data Systems, Milwaukee, and a staunch opponent of stalling, believes that there is seldom a compelling reason not to spell out the rationale behind decisions to act or not to act. Although every request can't be immediately satisfied, he observes, it can usually be dealt with openly. He believes in a candid approach. "If the information that prevents me from fulfilling the request is confidential, I say so. If it's not I give the reason."

Markle of Fanny Mae believes: "Stalling is miscommunication. When someone presses me for a decision, I always try to deal with it straightforwardly. Frequently, the person pressing me has the information I need to make that decision. In that situation I'll ask that person for a recommendation—and often, I'll act accordingly."

Honesty and straight talk aside, many managers of MIS/dp departments report that day-in, day-out circumstances force them to stall, either regularly or occasionally. Stalling is often the by-product of intense competition for finite resources.

To Norman Epstein, executive vice president of information systems at E.F. Hutton, the New York-based brokerage giant, stalling is an integral part of business. It happens because users, frequently in a hurry for solutions, are rarely aware of the full dimensions of their problems. At the same time, many users often have enough corporate clout to set totally unrealistic deadlines for completing projects, he says.

"Typically, a user will come to us with a project and a do-it-yesterday attitude. It's also typical that as soon as we begin working on it, the user will begin to make changes," says Epstein. Because an effective grasp of the user's problem—and, hence, its solution—generally evolves over time, Epstein claims that a slower development pace

(Continued on page 94)

"The dp manager is frequently in the position of saying 'yes' to unrealistic, if not impossible, deadlines."

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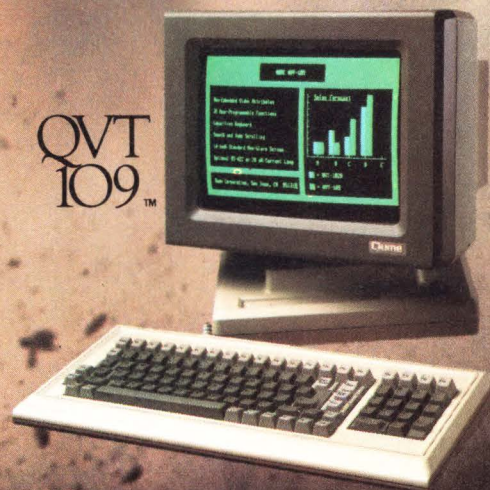
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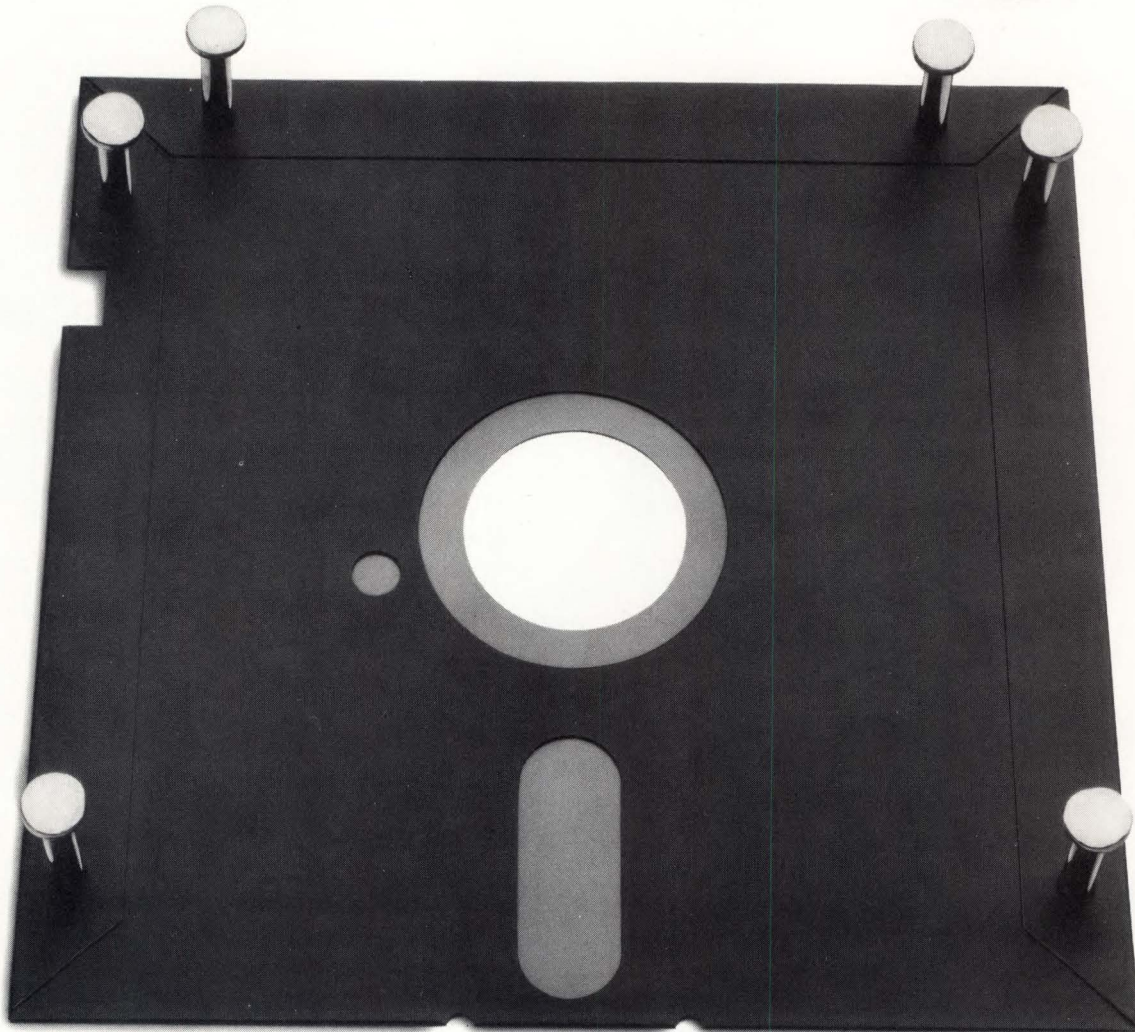
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MEMOREX





Robert Jackall, a sociologist at Williams College, says corporate bureaucracies can be viewed as "vast systems of organized irresponsibility."

(Continued from page 90)

is usually appropriate. Nonetheless, the dp manager is frequently forced to say "yes" to unrealistic, if not impossible, deadlines. Epstein explains: "It works something like this: You put me under pressure. I grin and bear it. Down the line, I make sure I can give you acceptable reasons for not getting you what you want when you expect it. Often, it's because you changed your agenda." In this situation, executive stalling begins to resemble negotiation: it becomes a form of "horse trading" in which both parties know the system and play by the same unwritten rules.

Epstein points out that he must be alert for situations in which the project is crucial but the user lacks a realistic grasp of all that's involved. This is a matter of judgment, based on his experience. Epstein emphasizes the need for complete candor in these circumstances. "It's essential that everyone concerned know the score."

These pressures apply regardless of the size of the organization. Richard Ludwig, applications and programming officer at Thrift Information Systems (Hewlett, NY), a service bureau jointly owned by two savings banks, reports a similar situation. Besieged by a constant flow of new projects, Ludwig has devel-

oped a method that helps users sort out priorities. "Project ideas in banking are often ephemeral," Ludwig says, "and you can often test users' interest by promptly getting back to them with a response that requires them to act. I'll often call a meeting to discuss a project, and no one will be available. Or I'll request further information and never hear anything." Users who are serious follow up on these requests. Their projects advance. The other projects just fade away. Ludwig says, "Throwing the ball back into the users' court takes a lot of the pressure off us."

These are all stalling tactics used during day-to-day operations. What does a manager do when disaster strikes? Resolutely face the music? Or start covering up? Although managers are reluctant to discuss these situations, most have faced disaster at some time.

One busy New York systems manager, who prefers to remain anonymous, relates a situation that could give nightmares to many dp-service providers. A lengthy report due to a large and important user came up a total wash-out. Until then, the manager had maintained an excellent record with this user. His solution was to pack up the faulty report and send it, not to the proper office a mile or two away, but to the user's West Coast office. When the user called for the report, he was told, "We sent it out on time—as we always do," but that the matter would be looked into. Later, the manager called the user back, revealing that "The mailroom fouled up and sent the report to Los Angeles. Fortunately, we've found time in our schedule to generate another copy." Six programmers spent the next day and a half working around the clock to fix the problem, and the report was delivered as promised. Eventually, the first package reached California, was duly logged and returned, and the user was never any wiser.

Disasters come in many forms. In one instance, a large corporation transferred direct control of dp from one corporate vice president's department to that of another. The new boss in turn made it clear to the head of dp that his projects were to have top priority. Naturally, the vice president didn't share this directive with the other vice presi-

dents, who also had urgent projects to be done.

Since one of the items on the old agenda was a pet project of the president of the company, the dp manager found himself in a bind. To disappoint the president or to defy his new boss were equally unattractive alternatives. On the other hand, to play one off against the other would not only look bad, it could very easily backfire. Finding a plausible way to keep the president in the dark long enough to reconcile the situation seemed the best course.

The dp manager handled the situation by finding a pretext to schedule a trip of indefinite duration to every city where the organization had offices, spending one day in each. Every day, the president's secretary would call the dp manager's office and be referred to a new city—the one he had just left. Meanwhile, his department completed the president's project even as it appeared to be working on the new boss's roster of projects.

When news reached the dp manager from his subordinates that the crunch was over, he returned. He was apologetic to the president for the delay in delivering his project: an unfortunate lapse in communications, no doubt due to the new corporate lines of command, he said. After all, the job had been ready and waiting for over a week.

The ability to emerge unscathed from such a situation must be considered a measure of a manager's adroitness. However, this doesn't explain the phenomenon of managers who seem able to ascend the ladder of power and success by avoiding any discernible action.

The element that ties all these situations together is responsibility—or the lack of it. Beneath his or her carefully maintained corporate mask, every successful manager realizes that in the corporate power structure a decision-maker is vulnerable. To take sole responsibility for a decision is to be the sole object of blame if something goes wrong.

For better or worse, this is a realistic perception, according to Robert Jackall, a sociologist at Williams College, Williamstown, MA. Jackall spent

over three years interviewing more than 100 middle- and upper-level executives in two large corporations. His conclusion, summed up in his award-winning article "Moral mazes: Bureaucracy and managerial work," *Harvard Business Review*, September-October 1983, is that corporate bureaucracies can be accurately viewed as "vast systems of organized irresponsibility." The capriciousness of individual corporate fortunes combines with subjective definitions of performance (as opposed to objective evaluations of work quality) to create a climate in which stalling rather than diligence produces rewards. This is a far cry from the work ethic, which insists that sweat and sound decision-making are the keys to advancement.

According to this view of corporate life, the key to ultimate success is not superior decision-making but avoidance of responsibility. However, considerable latitude exists for managers to make mistakes as long as they can effectively "outrun" them. "Some managers argue," says Jackall, "that outrunning mistakes is the real key to managerial success. One way to do this is by manipulating the numbers." As an example, Jackall cites the practice of "starving" or "milking" a plant: deferring capital expenditures, such as equipment upgrades, for the sake of a favorable balance sheet. According to Jackall, managers who employ these tactics "may leave behind them deteriorating plants and unsafe working conditions, but they know that if they move on quickly, the blame will fall on others."

If this seems an unduly bleak picture of American executives, any of the executives quoted here would hasten to point out that although they play by the rules, they don't make them. Since they perceive the reality of corporate life as the route to success, they take it as it comes.

Dp and MIS executives, however, are more likely to inhabit the ranks of the activists than of the high-level strategic stallers. After all, they've got a lot of work to do. And if you should occasionally need to stall your way out of a tight spot, just remember—you've got a lot of company. ☐

Edward P. Stevenson is a free-lance writer and editor based in Jersey City, NJ.

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CIRCLE 48

HOW TO MAKE STAND- ALONES SHARE

Multi-user add-on boards can be a cost-effective way to let your micro users work as teams.

by Bill Kalb

The personal computer's conquest of corporate America may have been founded on user dissatisfaction with centralized computing systems, but it actually highlighted a key benefit of the old mainframe. Centralized systems allow employees to share the information they need to do their work. Sharing is much more difficult when an office is filled with stand-alone micros.

The good news is that, ironically, the micro's inability to share easily has given rise to personal computers that act like the mighty old mainframe. Multi-user personal computers offer users the advantages of micros—speed and flexibility—and the ability to share data easily as well. A typical multi-user micro has 256,000 bytes (256 Kbytes) of random-access memory (RAM), a central-processing unit

(cpu) that handles bytes of 16 bits or more, a 10-megabyte hard disk, and a 5¼-inch floppy disk, plus a multi-tasking, multi-user operating system to handle communications between the system's terminals and multiple programming.

The bad news for corporations with slews of personal computers is that these systems cost from \$10,000 to \$32,000 each. Many organizations are just assimilating their investments in stand-alone micros and are not ready to implement even a slightly different technology. For those corporations, however, there is a multi-user option: boards and software that turn a solitary micro into a nerve center supporting handfuls of users.

The hardware consists of system-expansion boards that plug into the personal computer and connect

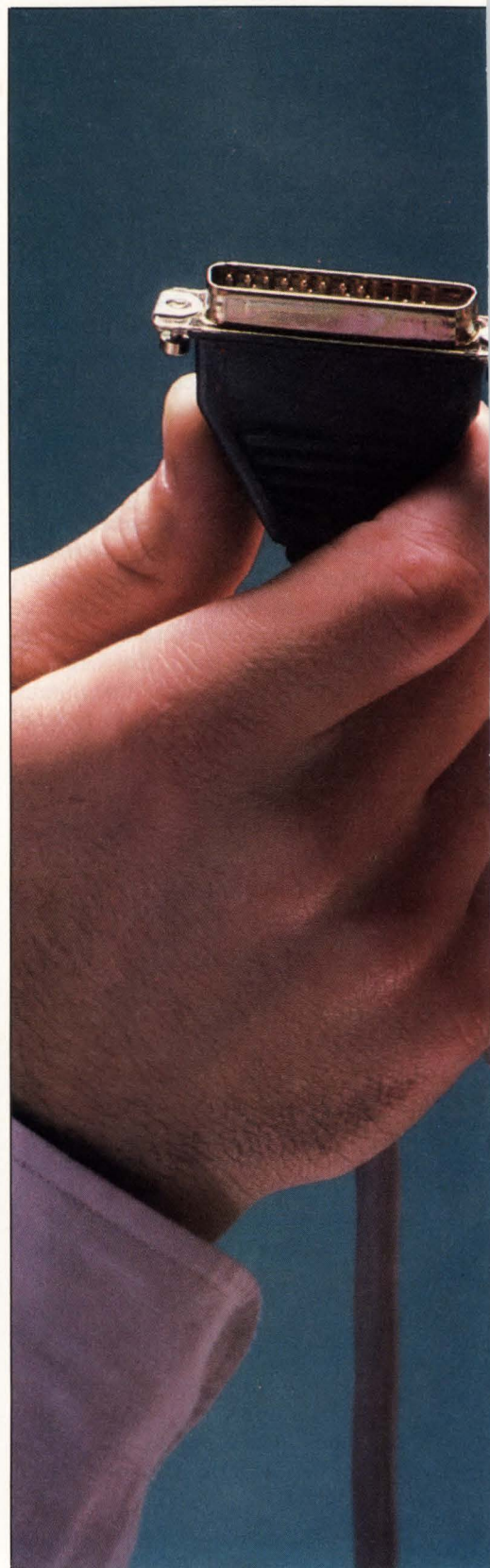


Photo by Bob Ward



modems, printers, terminals, or other micros, which act either as dumb or smart terminals, into the system. The multi-tasking software lets the micro handle the extra terminals and operate as an input/output device. It lets the computer's cpu regulate communications between the system's terminals, and it controls access to disks, programs, memory, and peripherals.

Some offices choose to convert their micros using only software. But some experts advise against this approach. "It's possible to run a multi-user system on software alone, but a high penalty will be paid in systems degradation, particularly in speed," says Terence Gilmore, president of Chestnut Computer Creations, a Hatfield, PA, consultancy.

A software-rigged multi-user system becomes slower as more and more terminals are added to it, or as the central computer's workload increases. Performance can be propped up by bolstering the micro's memory capacity, but processor speed—a more or less stable factor—is a more important determinant, says Bilmore.

In an add-on system, the faster the central computer's cpu and the greater the memory (512 Kbytes of RAM is ideal), the smoother operations will be. Users of personal computers with less capacity will experience delays in processing and cpu accessing. But, with the right combination of supplemental-memory boards and add-on hardware, you'll be able to squeeze maximum effi-

ciency from your multi-user operating system.

There are two types of multi-user add-ons: shared- and distributed-logic systems. Each has its advantages and disadvantages, depending on what kind of equipment your organization has. In fact, one of the long-standing arguments among multi-user systems—be it a supercharged stand-alone personal computer, a supermicro, a minicomputer, or a mainframe—concerns shared vs. distributed logic.

In a distributed-logic setup, each terminal or micro on the system uses its own cpu and memory, each of which is either in an expansion box inside the terminal or in the central computer. Disk access and other input/output functions are handled by the central computer, but program processing is handled by the terminal. In essence, the user has a smart terminal or, in another sense, a personal computer without its own disk drive.

The result is a system that gives users independence—to a point. Imagine, for example, a distributed-logic system in which each terminal is designated 256 Kbytes of memory. As long as the terminals run applications that require less than 256 Kbytes, each can handle its own workload. But if a user runs a computing-intensive program like Wordstar (from Micropro International Corp., San Rafael, CA), he or she will require additional memory from the central computer. If too many of these demands are made at once, they

“When two users try to access the same memory in an inadequate system, somebody has to wait.”

Gilmore, Chestnut Computers

cause bottlenecks that slow input and output, disk and peripheral access points, and central processing.

In a shared-logic system, the central computer's memory and a high-speed cpu handle all applications. Input and output traffic jams are less likely, but too many spreadsheet or word-processing programs can drain the central-processing unit. Shared-logic systems usually use dumb terminals.

If your stand-alone computers have little memory, you're probably better off using distributed logic, even though it's more expensive. For if you put a shared-logic multi-tasking operating system in an IBM Personal Computer with 256 Kbytes of random-access memory and two 5¼-inch floppy drives, the system's performance will suffer when two users are working at the same time, and become annoyingly poor when three or four plug in.

How bad can performance get? If four users typing 60 words a minute run a word-processing package under shared logic on a personal computer with 256 Kbytes of memory, the system could run as much as a line behind the typists. If a task requiring a lot of computation were added—say, if a user rearranged paragraphs—it would take precious extra seconds to finish the job.

To perform smoothly, shared-logic add-ons require a fast cpu and a memory of 1 megabyte or more. And even then, degradation is not entirely unavoidable. Distributed logic, on the other hand, is more expensive, but it allows small systems to handle more users and greater workloads without exacting such a high price in performance.

MULTI-USER SUPERPHONES

New facets of multi-user, multi-tasking computing are being explored daily. Northern Telecom, Richardson, TX, and Digital Research Inc., Pacific Grove, CA, recently joined forces to distribute a multi-user add-on for voice/data telephones.

The combination of Northern Telecom's Displayphone and Digital Research's Starlink multi-user add-on board lets Displayphone users connect to IBM Personal Computers and compatibles to share files, software, and data simultaneously. The package includes the phone and a keyboard. (The phone operates as a dumb terminal.)

Starlink is one of several combinations of hardware and software that expands a single IBM PC into a multi-user system. The package links up to four Displayphone terminals to an IBM PC, PC XT, or compatible system. Each phone will have simultaneous access to applications running under the PC-DOS and CP/M operating systems. At \$1,800 per station, the price includes four Displayphones and a Starlink board.

BOOSTING MICROS



Regardless of which logic system you choose, add-on systems have two big advantages over true multi-user machines. First, they're cheaper, and second, they can be set up without interrupting the routines of employees. "You can run the software you've been running, and on the same machines. Nobody has to learn new machines and new programs," says John Meyer, hardware-division manager of Digital Research Inc., a Pacific Grove, CA-based vendor of operating systems and add-on boards.

Add-on prices are about \$1,800 for an intelligent terminal, \$1,100 for a distributed-logic board, \$700 for a monitor, keyboard, and software. A shared-logic board costs about \$1,700, including multi-tasking software to handle four dumb terminals.

Given the popularity of the IBM PC,

PC XT, and PC AT, it's not surprising that many vendors are creating products that turn these machines and their clones into multi-user systems. (The PC AT is a three-user system.) Digital Research, for example, offers an add-on multi-user system based on shared logic. Starlink is an expansion box that plugs into an expansion port on an IBM PC or, preferably, a PC XT. The box contains a 16-bit Intel 8088 cpu (the same one that's in the IBM PC) and 64

Kbytes of memory.

Starlink comes with Concurrent DOS, software that allows it to run as many as five programs at once. It also comes with a buffer package that allows input/output requests to be held in memory for processing, a feature that eliminates congestion in the input/output ports. Its price tag is \$1,695.

Digital Research, originators of the CP/M operating system that directs micros like the Apple IIe, says four IBM PCs or PC clones can be plugged into Starlink. And four windows on one of the terminals allow a supervisor to monitor all the work being done by users on the system.

You can also hook Macintoshes from Apple Computer Inc., Cupertino, CA, micros made by Kaypro Corp., Solano Beach, CA, and other non-IBM computers into Starlink as dumb terminals. Digital Research offers a special software package to make sure non-IBM computers emulate the right kind of dumb terminals for Starlink. This means non-IBM micros, which the system sees as dumb terminals, cannot use their own cpus, memories, or programs while hooked up to Starlink. Rather, they run off the central IBM micro. The IBM PCs on the system also can't access any information from the incompatible units, a hindrance to the goal of allowing all users to share information.

This doesn't mean it's wasteful to hook non-IBM micros into Starlink. Even though they function as dumb terminals while hooked up, such micros can be pulled out of the system and used as stand-alones. Also, if the central IBM PC is part of a larger network linked to the corporate mini or mainframe, the micros in the multi-user cluster can also access the mainframe through the central unit.

Starlink offers many advantages, but Meyer concedes that it suffers from in-

"A software-rigged multi-user system becomes slower as more and more terminals are added to it, or as the central computer's workload increases."

BOOSTING MICROS

efficiencies in input/output-intense applications. With four micros sharing a central cpu, disk drives, and input/output ports, there are bound to be inefficiencies. "Yes, there is a speed penalty," says John Meyer. "The expansion box operates as an input/output buffer. But any drop in speed is not going to be very noticeable unless there's a lot of input/output-intensive activity, as in word processing."

Alloy Computer Products of Framingham, MA, offers a distributed-logic approach to an add-on multi-user system. Alloy's PC Slave 16 is a board with a 16-bit Intel 8088 cpu and 256-Kbyte RAM, expandable to 1 Mbyte. The board allows an IBM PC to handle up to 16 IBM PCs or compatible personal computers, allowing them to share by doubling as dumb terminals.

With all 16 units running and the input/output burden rising, PC Slave 16 will drag its feet. But for \$1,800 apiece—\$1,100 for the board and \$700 for a keyboard and terminal monitor—the product is an economical way to link IBM PCs, PC XT's, PC AT's, and their clones. The system runs under the MS-DOS operating system (from Microsoft Corp., Bellevue, WA) with RTNX multi-tasking software.

RTNX costs \$195 extra. It can also handle up to 31 terminals when two 16-unit systems are cabled together. (One of the terminal ports connects the two central personal computers.)

Alpha Microsystems has taken its Model 170 add-on board a step beyond IBM compatibility. Rather than simply turning an IBM PC XT into a multi-user computer, it turns it into a supermicro that can run both MS-DOS-based software and programs written specifically for Alpha Micro multi-user systems. Its \$2,800 price includes Alpha Micro's Amos multi-user operating system.

Finally, a new way to build an IBM PC or PC XT into a four-user system was recently announced by Anex Technology Inc., a Congers, NY, startup. Anex's Multi-PC is an eight-slot

expansion chassis that accommodates a 10- or 20-Mbyte hard disk. It attaches via an expansion board to the cpu of the PC or PC XT. Three IBM-compatible monitors and keyboards are then attached to Multi-PC, giving each user ½ Mbyte of memory to simultaneously run the same or different programs running under the IBM PC's PC-DOS operating system. Another optional board plugs into Multi-PC to let four users share a printer. Multi-PC costs \$1,695.

Sharing may very well turn out to be the key personal-computing issue of the next year or so. Multi-user add-ons offer an alternative to more expensive approaches to sharing information, like scrapping existing micros for multi-user systems or installing local-area networks to link micros. □

Editor's note: This is the first of a series of articles about products that convert microcomputers into "corporate personal computers." Subsequent parts of the series will examine storage and backup, communications, enhancement boards, and input and output devices. Next issue: enhancement boards.

Bill J. Kalb is a free-lance writer based in Hatboro, PA.

"With add-on systems, users can continue to run the same software and computers."

Meyer, Digital Research

MULTI-USER ADD-ONS

Vendor	Product	Description	Price	Circle
Alloy Computer Products (617) 875-6100	PC Plus	For IBM PC, PC XT, and MS-DOS-based micros with RTNX; uses distributed logic; supports up to 16 users	\$1,995 \$195/RTNX software	406
Anex Tech. (914) 268-2400	Multi-PC	For IBM PC, PC XT, PC AT, and compatibles under Multi-DOS; uses shared logic; supports up to 3 users	\$1,695/8-slot expansion chassis	407
Digital Research (408) 649-3839	Starlink	For IBM PC, PC XT, PC AT, and compatibles under Concurrent DOS; uses shared logic; supports 4 users	\$1,695/4-slot board	408
IDE Assoc. (615) 663-6878	Ideashare	For IBM PC, PC XT, PC AT, and compatibles running Ideashare software; uses shared logic; supports 4 users	\$325/software \$210/board	409
PC Tech. (313) 996-9690	XTender	For IBM PC, PC XT, PC AT, and compatibles under Concurrent DOS; uses shared logic; supports 4 users	\$4,000 to \$5,000/4-slot board; \$800/Concurrent DOS	410
Software Link (404) 998-0700	Multilink Advanced	For IBM PC, PC XT, PC AT, and compatibles running Multilink Advanced software; uses shared logic; supports 8 users	\$790/two boards \$495/software	411



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TELECOMM: WHAT HATH BEEN WROUGHT?

Breakup or breakdown, divestiture means putting AT&T's pieces together again.

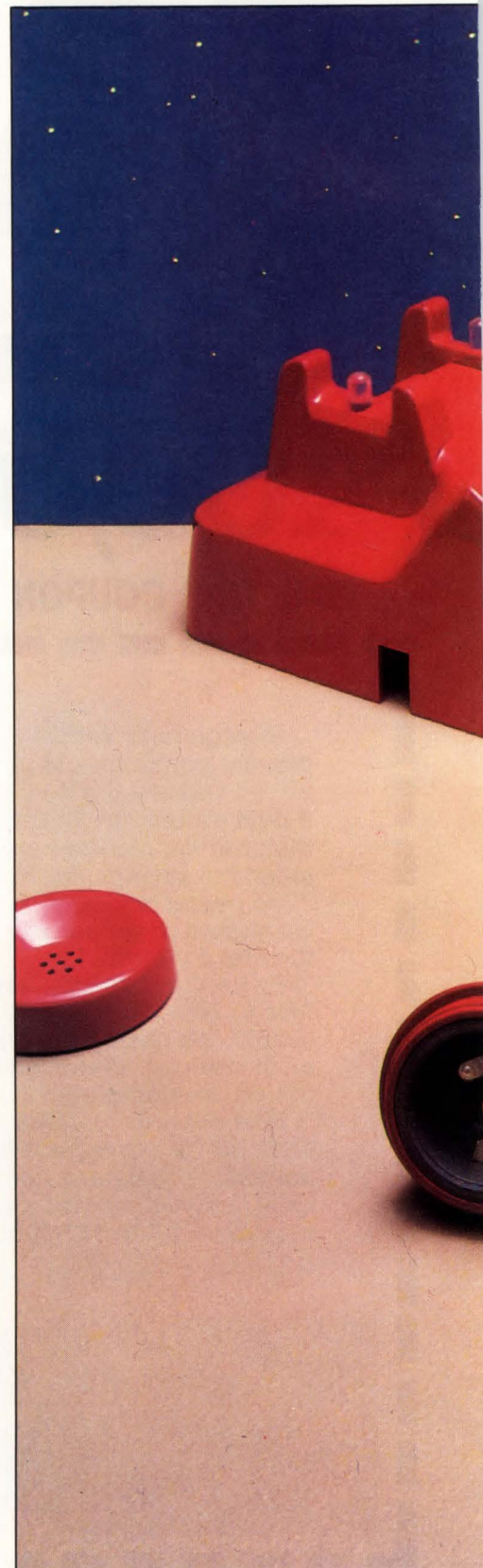
by Gary Stix, Associate Editor

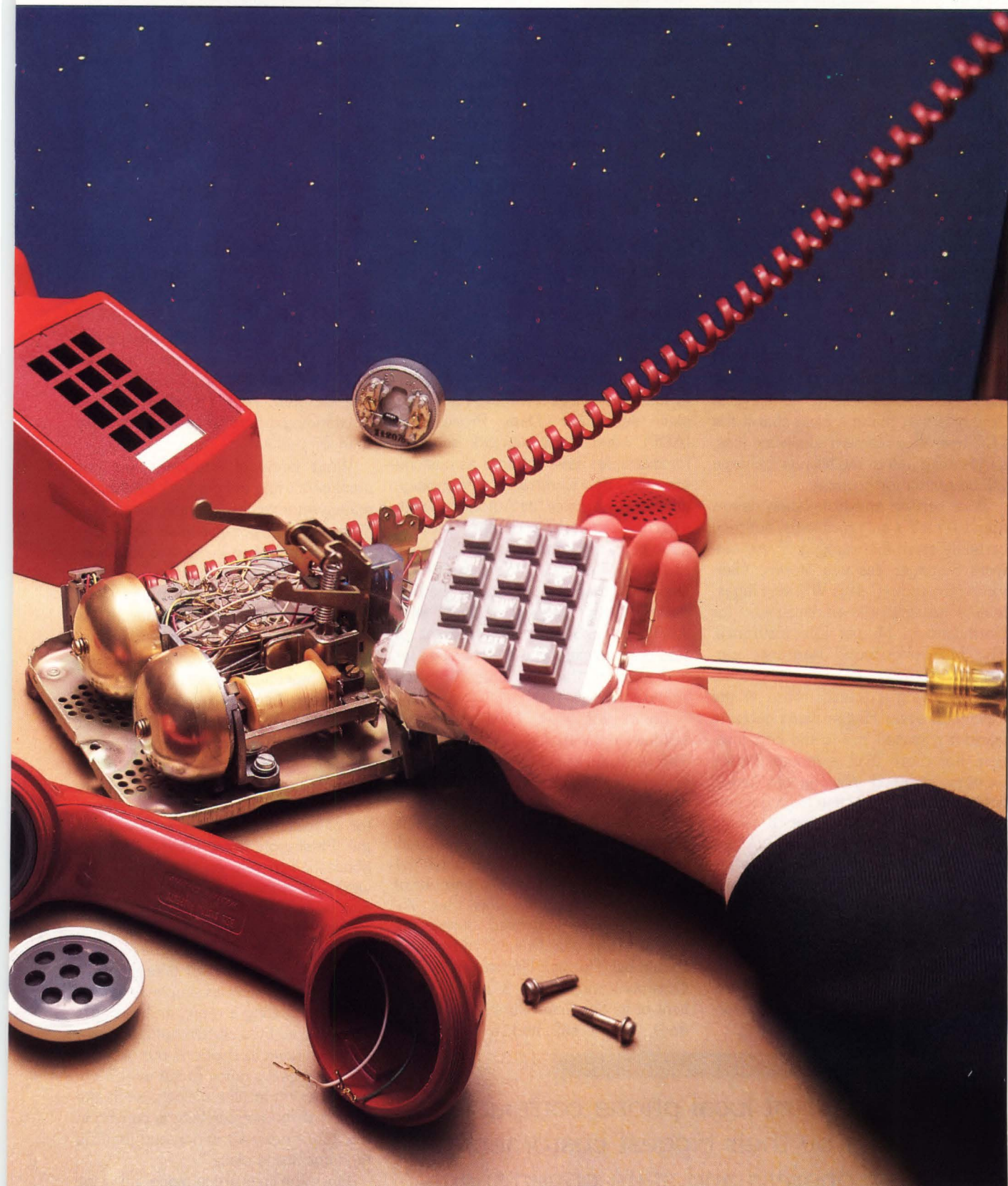
What indeed! A year after the reorganization of the world's largest corporation, some executives have begun to look back on 1/1/84, the date of the Bell System divestiture, as a calamitous turning point in the management of their corporate telecommunications networks. For many, the first year of the post-divestiture era had little to recommend it.

Obtaining private-line and wide-area telephone service (WATS) from what had been renowned as "the greatest phone system in the world" has begun to take on some of the characteristics of building a phone network in a third-world nation. For example, in April, American Telephone & Telegraph (AT&T) was unable to meet its schedule for private-line orders four times out of five. Although AT&T has begun to

shorten a long backlog of orders, the early months of 1984 gave credence to doubters who questioned whether such a vital component of the nation's infrastructure as telecommunications should be open to the vagaries of competition.

What particularly vexes the network manager is that many traces of the pre-divestiture era remain. A crucial provision—the monthly "end-user common-line charge" that residential and single-line business customers would pay to defray a part of the cost of maintaining the local telephone company's fixed plant—has been postponed until the middle of this year. A probable reason: the unwillingness of the federal government to address a controversial issue during a presidential election year. As a result, long-distance rates still subsidize the costs of local





phone service. "Corporations are realizing the cost of divestiture without its benefits," says Page Montgomery, vice president of Economics and Technology, a Boston consultancy.

Even more exasperating is that deregulation has, to a degree, meant more regulation. Before divestiture, rates and rules established by the Federal Communications Commission (FCC) and the state public-utility commissions were a fundamental concern to corporations. Now, that bureaucracy includes a federal judge and Congress. U.S. District Judge Harold Greene, who presided over the divestiture proceedings, continues to tell AT&T and the Bell operating companies (BOCs) how they should interpret his Modified Final Judgment, the divestiture agreement. And there are some rumblings in Congress that make it clear that if the FCC tries to implement single-line fees, a legislative halt to the billing surcharge will be swiftly forthcoming.

Poor service and installation delays aren't AT&T's only problems, but they certainly merit first ranking. Every network manager has war stories. "Service is grotesque," says William Hegge, telecommunications administrator for Northwestern Mutual Life Insurance. The Milwaukee-based insurance carrier's story may be a familiar one. When moving a branch office in the Cincinnati area, Hegge was unable to transfer a leased line to the new location. For more than a month, Northwestern switched into the old leased line via dialup connection from the new office. "Prior to divestiture, it would take seven hands within the Bell System to process a circuit order. Today, an order passes through seven hands in each new organization: AT&T Communications, Wisconsin Bell, and another Bell operating company. The bureaucracy has subdivided and conquered, but it didn't establish procedures to anticipate the complex problems divestiture caused."

Particularly hard-hit are organizations that have an immediate need for new circuits, like Northwestern Mutual Life. Even politicians who may be called on to make important policy decisions this year had problems. When, for example, an advance man for Senator John Glenn experienced difficulty in ordering press phones before last year's New Hampshire presidential primary, he did the next best thing. Spying a bank of telephones in a hotel lobby, he taped an "out-of-order" sign to the booths to reserve them for news reporters.

But such survival tactics are neither applicable strategies nor appropriate solutions for most corporations' telecommunications problems. Organizations that furnish network-based information services have also had struggles. Automatic Data Processing's (ADP) value-added network services, for example, have suffered as customers for its Comtrend commodity-information service, its Autonet packet-switched network, and other services have been forced to wait for the requisite line installations. "If we don't have lines on a client's premises by the due date, we can't make the billing," says Andrew Palkovitz, vice president of telecommunications and technology for a division of the Roseland, NJ-based services firm.

For its part, AT&T Communications acknowledges that it has a problem: The procedures set in place last January are inadequate to coordinate line orders with the now-independent BOCs, AT&T Communications officials say. Prior to divestiture, nearly all private lines were installed within 24 working days; in April only one out of five installation dates was met. Although service improved during the course of the year, it's still not what it should be. Through November, AT&T Communications says it met 67 percent of its deadlines within 48 working days, but it still had a backlog of

16,700 orders. The former AT&T Long Lines promises continued improvements, but AT&T Communications officials still don't know when they will be able to guarantee service within the 24-day pre-divestiture interval.

Many network managers wonder too. "We're not satisfied with AT&T's progress to date," says Roberta Frackman, vice president of corporate telecommunications for Manufacturers Hanover Trust Co., New York. Echoing Frackman's assessment, Andrew Palkovitz of ADP says, "AT&T's delivery rate is not as good as officials report. On numerous occasions AT&T has advised us to cancel existing orders and reorder, so as to give the appearance that more orders were completed than were actually delivered." As of late October, ADP's several hundred outstanding orders had dropped by less than 20 percent.

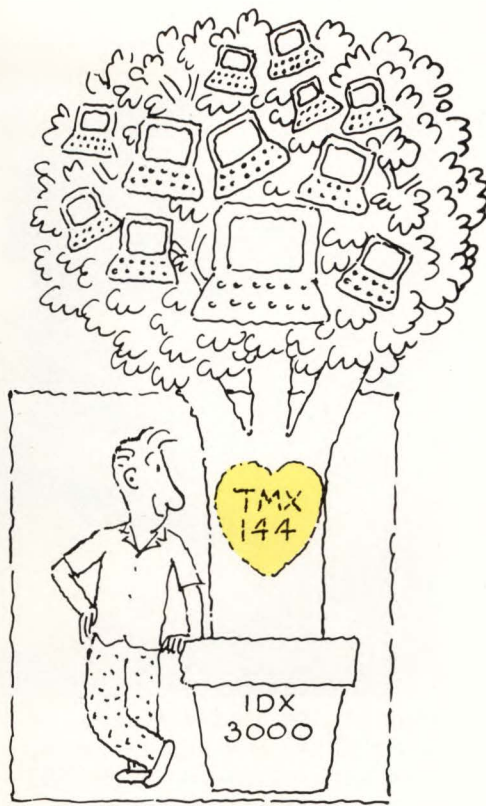
What kinds of strategies are top managers using to fight back? A simple maneuver involves planning installation dates as far as possible in advance. But the most ambitious tacks—private telecommunications networks—circumvent the Bell System altogether. Westinghouse Electric Corp., Pittsburgh, has taken both courses of action. Even before divestiture, Westinghouse installed its own microwave system, which connects more than 25 corporate sites in a nearly 30-mile radius around greater Pittsburgh. "We can add a circuit as we need it and we don't have to go through the local telephone company to get it," says Robert E. Bennis, director of telecommunications. Outside of the Pittsburgh area, where Westinghouse has to rely on the AT&T network, Westinghouse Electric's complaints are the same as those of any other corporation. To combat installation delays and monitor order status, Bennis and staff "do not take anything for granted. It's not as simple as writing an order, getting a reply, and having a line installed by a certain date. In every case, we have to check on our order. If AT&T says it's going to cut over Monday morning at nine o'clock, we make sure that the copper wire is coming in the door Friday afternoon and that the modems are in place."

Once the lines are in place, servicing

The specter of local phone companies abandoned by their biggest customers has worried Congress and state governments.

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THE T1-EFFICIENT NETWORK



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them becomes another headache. Responsibility for an outage can lie anywhere along the network—with AT&T Communications, with one or more BOCs, or with a variety of equipment vendors. "Divestiture is when you know you called the right person about a particular problem but he or she doesn't know it," says Jane Videtich, manager of corporate telecommunications at R.J. Reynolds, Winston-Salem, NC. By default, it's now the telecommunications customer who must monitor the network. Some corporations, such as Travelers Insurance, Hartford, CT, with a roughly \$48 million annual telecommunications budget, have established their own network control centers, which perform network diagnostics around the clock. "We try to diagnose a problem down to a particular vendor," says T. Travers Waltrip, vice president of Travelers' communications division. "We don't want to call three different vendors to a site, especially if we're paying for their time and material."

While waiting for service from a vendor, network managers can pass the time by attempting to decipher a stack of bills that includes monthly statements from local phone companies, long-distance carriers, and communications-equipment vendors. "Each group billed much more efficiently before divestiture," says Hank M.

Schoening, director of corporate telecommunications for Johnson & Johnson, the New Brunswick, NJ-based pharmaceutical and health-care products giant. "Prior to divestiture, anything related to customer premise equipment or line charges was sorted by a specific extension. Now, bulk billings for Centrex aren't broken down. Also, the error rate has gone up substantially." In fact, says Robert Ellis, president of the Aries Group, a Rockville, MD, consultancy, some customers may be paying twice what they should for certain services. "The local phone company may still think it's AT&T Communications' billing agent for WATS," adds Ellis. "But AT&T Communications is beginning to bill for business service directly. If the paperwork gets fouled up, the customer could get bills from AT&T Communications and the operating company for the same service. The accounting staff, who have been dealing with the local phone company for years, might approve the charges and pass them on. For five WATS lines that could amount to \$2,500 to \$5,000 a month."

What the duplicate-billing situation highlights is the need for a third party or general contractor to assume the pre-divestiture role of AT&T's National Accounts Teams, which coordinated the installation and servicing of telecommunications systems for large cor-

porations, providing end-to-end network management. Such a provision would allow an equipment vendor to intervene, manage a network, and at the same time assess a user's future equipment needs—in effect, to become a full-service agent. "If IBM or Digital Equipment Corp. [DEC] showed a customer it could manage the network, it could step in and replace present equipment with its own," says John F. Malone, president of Eastern Management Group, a Parsippany, NJ, consultancy.

Recognizing the need for "one-stop shopping," the FCC ruled last summer that AT&T could resell its regulated long-distance service through its unregulated subsidiary, AT&T Information Systems. The FCC decision—widely attacked by AT&T's competition as a step toward rebuilding the Bell System—weakened the commission's prior ruling, Computer Inquiry II (CI-II), which required AT&T and the local operating companies to maintain separate subsidiaries, one to sell hardware, the other to market basic transmission services. The FCC ruling allowed AT&T Information Systems to enter into an agreement with United Technologies Corp., Hartford, CT, to act as a supplier for so-called "smart buildings," which are wired for data processing, building management, and other services. AT&T Information Systems can also act as reseller for Wide Area Telecommunications Service (WATS), Message Telecommunications (MTS), and private lines. Besides the joint venture, it has not yet announced a more general service. Besides AT&T Information Systems, Southwestern Bell has begun to offer network-management services regionally; U.S. West's Interline subsidiary offers this service nationally.

Whether ready or not to take on a new role, AT&T and the BOCs have launched a concerted assault on CI-II. In a petition filed with the FCC last summer, AT&T contended that the separate subsidiary requirement should be scrapped because increased competition in telecommunications has eliminated the threat that AT&T would use revenues from transmission services to subsidize its equipment offerings. Meanwhile, several BOCs have asked

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the FCC for a waiver of a CI-II rule that requires local telephone companies to provide enhanced services, like packet-switching, only through separate subsidiaries. With a waiver, the BOCs could use existing transmission facilities to supply value-added network services at lower rates than those of competitors like Tymnet (San Jose, CA) and GTE Telenet (Stamford, CT). "Eventually, the BOCs might even find a way to interconnect the local packet-switched networks and establish a nationwide network," says Mark Winther, senior analyst for Link Resources, a New York-based market-research firm.

AT&T's attempts to unravel the regulatory threads haven't gone unchallenged. Many briefs have been filed with the FCC from a variety of user and vendor organizations that are protesting any attempt to integrate AT&T's transmission and unregulated components. The International Communications Association (ICA), Dallas, which represents corporations with telecommunications budgets exceeding \$1 million annually, told the FCC that elimination of CI-II would prove "disastrous." Says ICA counsel Brian Moir: "There should be a time when CI-II restrictions should be removed, but it's not appropriate that they be lifted now because AT&T Communications still controls over 90 percent of the market." (Some estimates put the percentage lower.) And when the BOCs' seven regional holding companies petitioned to enter several new lines of business, Judge Greene limited the amount of revenue they could derive from activities other than basic phone service. "Judge Greene told the BOCs they're still in the telephone business," says Bill Rich, telecommunications analyst for Northern Business Information, a New York market-research firm.

Yet, it is the "telephone business"—or lack of it—that has the BOCs worried. More and more, large corporations, reluctant to continue subsidizing local phone rates for residential customers, are turning to low-cost technologies, such as private microwave systems, as alternatives to local phone networks. According to Eastern Management Group, 31 percent of the nation's 500 largest corporations are by-

Poor service and installation delays aren't AT&T's only problems, but they merit first ranking.

passing the BOCs and 13 percent more plan to do so by 1987. With the number of their largest revenue generators shrinking, the BOCs may not be able to furnish basic phone service—"universal service"—at a cost that residential customers can afford. New York Telephone, for example, claims it's losing \$147 million a year—about 2 percent of total revenues—from bypass. That amount, which could more than quintuple in coming years, does not bode well for local phone rates.

The ICA, however, contests the power of the purported bypass threat. It found that its members use their private networks for a small fraction of their total transmission requirements. What spurred some corporate users to forgo their local carriers, according to an ICA report, was the uncertainty following the Bell breakup, more than cost savings and the fact that some local phone companies could not accommodate their specialized transmission needs, such as high-speed data transfers and video conferencing.

The reason most large telecommunications customers shirk bypass is simple: They have no wish to enter the phone business. But network managers may soon come across sales proposals that will allow them to connect their lines to AT&T's switching center. As a result of regulatory strictures, AT&T has strong incentives to circumvent both local phone systems and access charges—or to help a customer do so. A \$4 fee or end-user common-line charge, intended to be levied on residential and single-line business users, has been postponed by the FCC after Congress protested that such a charge would interfere with residential users' right to universal service. Modified proposals focus on a \$1 to \$2 fee. This means that long-distance carriers,

which subsidized local phone companies by inflating long-distance rates, are still paying some \$9.7 billion worth of local phone-company expenses in carrier common-line access charges each year. These regulations protect residential customers, but Centrex and multi-line business users now have to pay a monthly fee of up to \$6, causing long-distance rates to drop by 6.1 percent—roughly equivalent to the \$1.1 billion subsidy removed from the long-distance rate structure. For its part, AT&T has asked the FCC to allow it to connect lines directly to a customer's premise without switching through the central office, which would enable AT&T to charge rates that may be lower than those of local operating companies. While AT&T awaits the FCC's approval of tariffs that would enable large corporations to bypass local phone companies, Washington-based MCI Communications, free of the FCC's regulatory mantle, has already begun to hook customers to its long-distance switching center via cable-television lines.

The specter of local phone companies abandoned by their biggest customers has worried both Congress and state governments, which have begun to discuss imposing penalties for bypass. The California Public Utilities Commission has even considered banning bypass, which is significant, according to Brian Moir of ICA, because the state of California is the largest single user of bypass outside of the federal government. The FCC, meanwhile, has slapped a \$25 monthly fee on each private line that is directly connected to a long-distance network in order to balance revenues lost from private branch exchanges (PBXs) that "leak" long-distance traffic into local networks. The surcharge is expected to generate \$231 million annually.

Rather than imposing a bypass tax, some regulators are taking approaches more to the liking of the business community. A joint panel of federal and state regulators has proposed reducing tariffs for large phone company customers. And Illinois, for example, has started to "de-average" local phone rates in cities and rural sections based on the actual cost of service. The prac-

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tice causes rates in cities to fall. Because most customers likely to consider bypass reside in cities, de-averaging should reduce the likelihood of a mass migration away from local phone carriers.

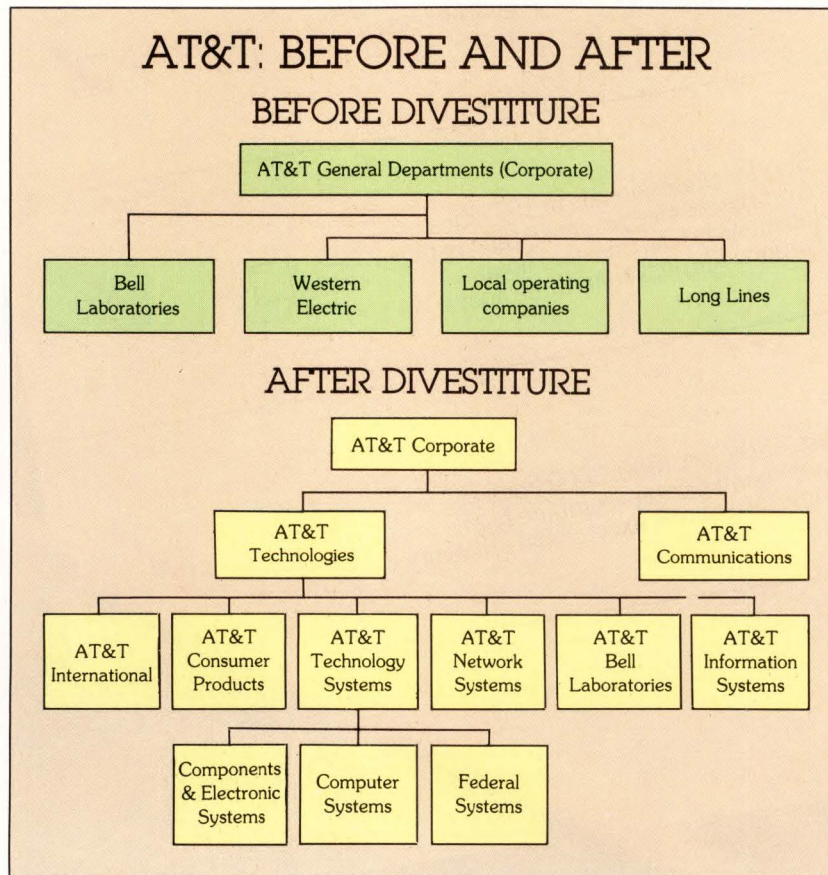
The BOCs are finding their own solutions to the bypass problem. Several have begun to build sophisticated new networks, employing the technology typically used in bypass systems. Ohio Bell, for example, plans to install more

than 550,000 feet of fiber-optic cabling through the end of 1987 at a cost of \$87 million. Bell South, on the other hand, has begun to market microwave services. Some BOCs, not wanting to be left out of a potential new market, have indicated that they may be willing to use fiber-optic, microwave, or bypass-type technologies to connect customers directly to long-distance carriers.

Although many aspects of the by-

pass issue are volatile, costs for both voice and data transmission remain relatively stable; in some cases, they've actually decreased. For most business customers, the 6.1 percent decrease in long-distance rates more than offset the \$6 user charge. Still a question is the rate structure for private-line tariffs. BOC proposals for private-line access charges have been rejected twice by the FCC. Criticizing their requests as overly complex, the commission de-

MA BELL'S OFFSPRING



Each regional holding company has a one-seventh interest in Bell Communications Research (Bellcore), which supplies technical assistance for network planning, engineering, and software development as well as coordinates the efforts of the regional holding companies for national emergencies and natural disasters. Bellcore's staff of 8,000 was drawn from Bell Laboratories, Western Electric, other AT&T divisions, and the BOCs.

For the most part, the divestiture agreement confines the BOCs to supplying regulated phone service. But besides local service, the BOCs supply the Yellow Pages, cellular-radio mobile-phone service, and they can sell, rent, but not manufacture, equipment. All three services are furnished through separate subsidiaries. Since divestiture, the BOCs have petitioned U.S. District Judge Harold Greene to enter new lines of business, such as tenant services, computer maintenance, real-estate sales, even the long-distance market. Greene has banned any entry into long-distance services, while placing other restrictions on the BOCs' diversification plans.

Under divestiture, AT&T supplies long-distance service between LATAs, in competition with other long-distance carriers. AT&T Communications, the unit responsible for long-distance transmission, is regulated by the Federal Communications Commission. In most cases, AT&T Communications, formerly AT&T

Divestiture separated the suppliers for long-distance and local telephone service. Each of the 22 Bell operating companies (BOCs) was incorporated into one of seven regional holding companies (see accompanying chart). On January 1, 1984, ownership of the regional holding companies was transferred from AT&T to its stockholders, each receiving one

share of a regional holding company for every 10 shares of AT&T.

The boundaries of the BOCs' service areas are defined by 161 local access and transport areas (LATAs) and the rates for local service are regulated by the state public-utilities commissions. The BOCs have responsibility for local service and provide access to long-distance carriers.

BROKEN BELL

layed deciding on AT&T's request for tariff increases on private lines and asked the local carriers to justify fees that would increase several-fold the cost of maintaining interoffice or multi-point, private-line networks.

When the FCC finishes deliberating, private-line rates for multi-point networks are expected to increase by as much as 30 percent, forcing some network managers to consider reconfiguring their telecommunications net-

works. The sharpest increases will hit private lines that cross any of the 161 local area transport areas (LATAs), the geographical boundaries within which local phone companies provide service. To minimize their costs and to obtain superior service, says Robert Ellis of the Aries Group, network managers should keep as much traffic as possible within a LATA. "If you're only dealing with New Jersey Bell, for example," says Ellis, "you can get lines installed

within 10 to 20 working days." For transmissions that cross LATA borders, Ellis suggests that managers concentrate as much traffic as possible into high-capacity lines. Eventually, there will be simpler solutions. AT&T, for example, is developing software that will enable "virtual" private lines to be created using the switched public network.

Billed as a likely casualty of divestiture, Centrex—an alternative to a

Long Lines, is also regulated by utility commissions for toll traffic (inter-LATA calls) within state borders.

The activities of Western Electric, AT&T's former manufacturing division, have been folded into AT&T Technologies, the umbrella organization for manufacturing, marketing, and service of computer and communications equipment.

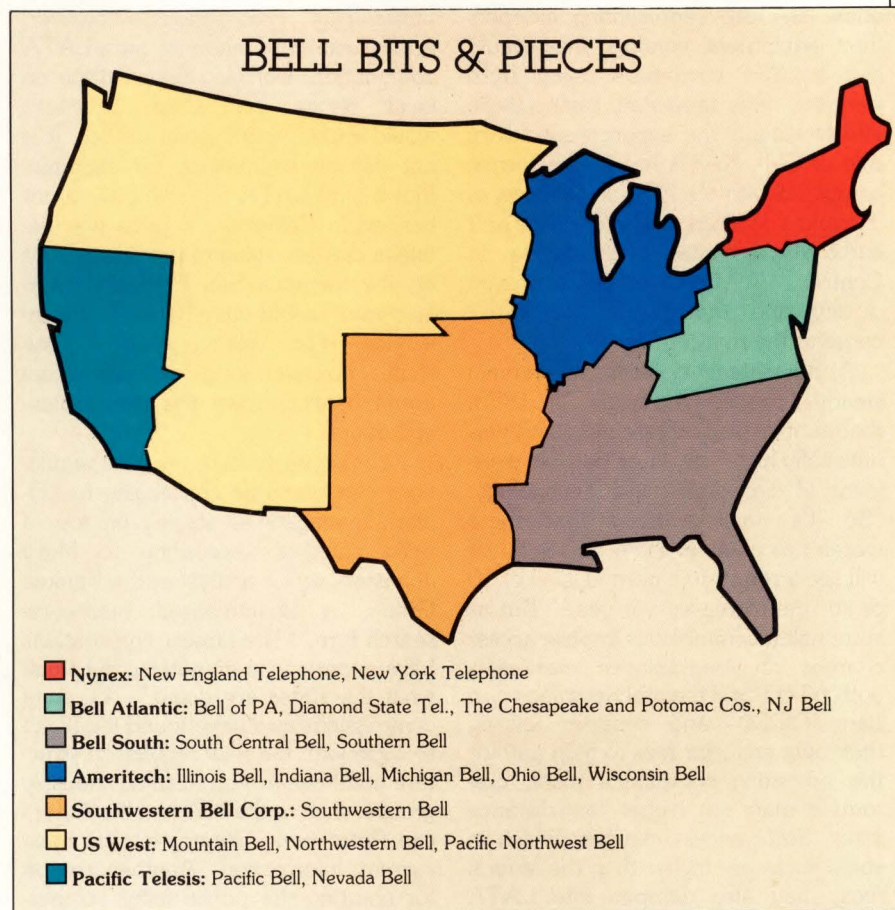
AT&T's research, marketing, and manufacturing facilities are separated from AT&T Communications' regulated business. If AT&T Communications buys equipment and services from AT&T Technologies, it does so at market prices. The restrictions are to prevent revenues from the regulated side of AT&T from subsidizing lower prices for equipment sales.

The various divisions of AT&T Technologies include:

- AT&T Bell Laboratories, the noted research-and-development organization.
- AT&T Network Systems, which designs, manufactures, markets, and services transmission switching and central-office products.
- AT&T Technology Systems, a division that includes three subdivisions: Components and Electronic Systems, which produces silicon chips and other electronic devices; Federal Systems, which manufactures products for the federal government; and Computer Systems, which develops, manufactures, and markets general-purpose computers and computers for use in specialized telecommunications systems.

- AT&T Consumer Products, which manufactures and wholesales communication systems for residential and small-business customers.
- AT&T International, which markets products and services outside the United States.
- AT&T Information Systems, formerly known as American Bell.

AT&T Information Systems is the de-regulated arm formed for the marketing of computers, phone-switching systems, and other equipment. A reorganization, announced in September, would consolidate AT&T Consumer Products and a subdivision of AT&T Technology Systems into AT&T Information Systems.

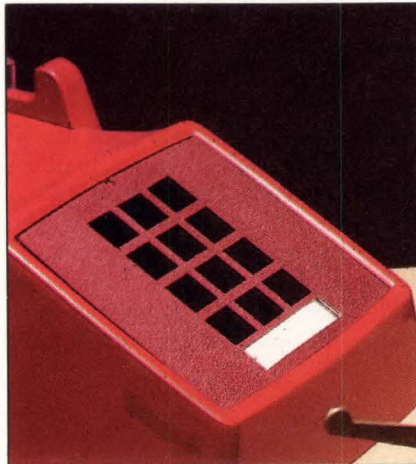


BROKEN BELL

PBX—has survived and apparently flourished. Centrex, the BOC-supplied service that uses the local carrier's central-office switching for a customer's internal communications, has had its rates reduced in many states to offset the impact of higher user charges. At least one survey found that more Centrex lines were installed last year than in 1983. The BOCs have also begun to improve Centrex; one project contemplated to keep competitive with advanced PBX systems is the integration of voice and data communications. However, the Washington-based North American Telecommunications Association (NATA), representing independent equipment vendors that would like to lure customers away from Centrex, have protested, saying these efforts violate the separate-subsidiary rule of CI-II. NATA has filed a formal complaint with the FCC. In the view of Travelers' Waltrip, however, there isn't currently a suitable alternative to Centrex. "A 9,000-line PBX of proven quality and reasonable cost hasn't come to the marketplace."

At the state level, local rates remain steady—for the time being. "In 1983, the number of local-rate increases was unusually high," says Lee Selwyn, president of Economics and Technology. "So it's not surprising that there weren't as many in 1984. In 1985, we will see a return to a normal level of 30 or so rate increases per year." But as state utility commissions impose access charges on long-distance carriers—both AT&T and the other common carriers (OCCs)—and consider levying their own end-user fees to help pay for the operating company's plant, customers may see higher long-distance rates. State access charges, which in some cases are higher than the federal fees, may also dampen inter-LATA competition between long-distance carriers. "We're very committed to going into the interstate market," says Helen Peterson, manager of public communications for MCI, one of AT&T's competitors. "But we're concerned that unduly high access charges could discourage competition."

In a few states, there also is limited competition between the BOCs and the OCCs for intra-LATA toll service. Most



public-utility commissions, however, are reluctant to endorse intra-LATA competition, worrying that a drain on local phone companies' revenues would endanger universal service. It is not difficult to imagine, for example, that if intra-LATA toll traffic were not banned in California, a price war between carriers vying to provide service on the lucrative San Francisco-Oakland route could ultimately affect local service. For relatively low-volume routes, however, long-distance carriers aren't beating down the commissioners' doors.

Keeping up to date on state regulations can prove as challenging to network managers as staying on top of price changes. According to Mary Johnston, senior analyst at the Yankee Group, a Boston-based market-research firm, "The largest corporations have experts who do nothing but track what the states are doing." The state commissions also have found it difficult to cope with the new regulatory structure and have turned to savvy industry groups, such as the ICA and the American Petroleum Institute, for the most current information. Another reason for courting the public-utility commissions: Some observers believe the FCC may turn at least part of the administration of federal access charges over to the states.

Many of AT&T's competitors—MCI, GTE Sprint, Satellite Business Systems, ITT, Allnet, and Western Union, among others—have been offering giveaways to attract customers: videocassette recorders, telephones, and other items. MCI is expected to

spend \$75 million for advertising this year; Allnet Communications Services is expected to double its advertising budget to about \$12 million. Exchanges in New York, Philadelphia, Washington, Milwaukee, Baltimore, and smaller cities have made the switch. But the marketing blitz will continue through mid-1986, by which time most of the nation will have been converted.

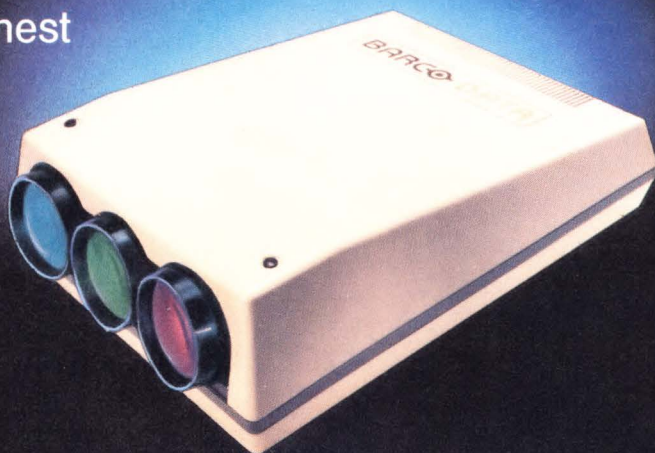
Although the OCCs are able to compete for the first time on an equal basis with AT&T, the amount of choice that customers currently have is expected to decline. Many analysts believe that dozens of resellers of long-distance service, which buy transmission capacity and sell it at a markup, will not survive in the deregulated world of telecommunications. "All they're doing is arbitraging the spread. That's not a basis for a permanent business," says Lee Selwyn of Economics and Technology. In fact, the resellers, especially those that haven't begun to build their own networks, have started to experience the tumult of a new era. U.S. Telephone, Dallas, has been acquired by United Telecommunications (Westwood, KS). Lexitel (Birmingham, MI) and LDX Group (Chesterfield, MO) have agreed to merge. Some resellers, such as United Telecomm, have responded by starting to construct their own fiber-optic networks.

Even a few of the major OCCs, such as MCI, may encounter hard times as they begin to pay higher carrier access charges for the high-quality circuits that heretofore have been enjoyed only by AT&T. "It's going to be a great deal more difficult to maintain a favorable price differential and continued profitability with charges for access to AT&T's quality circuits," says Selwyn. The OCCs' "ability to grow may have ended." Indeed, MCI has raised rates as its earnings have dropped sharply because of the equal-access charges. Even AT&T was unprepared for the access charges, and lower-than-expected third-quarter earnings were attributed to the carrier's having underestimated them.

For the moment, there's a long-distance capacity glut, and that means long-distance rates may remain low in

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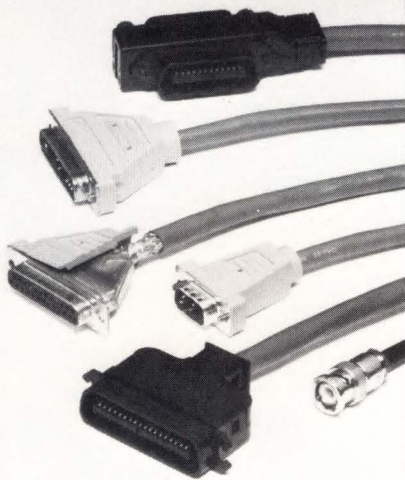
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the near future. And despite the confusion, network managers have been able to exploit what has become a burgeoning commodity market for transmission capacity by making optimal use of several different carriers. At Holiday Inns' Memphis, TN, headquarters, additional professionals have been hired to find the cheapest calling routes, says Chuck Jones, vice president of communications. "We have several people concentrating full-time on finding the supplier with the best rates," he says. "It's kind of tricky to find who has the latest discount and whether it's real or just smoke." Network managers, says Aries Group's Robert Ellis, should look carefully before switching calling loads to alternative carriers. Smaller volumes routed to each carrier may cause bulk discounts to be lost.

Like its competitors, AT&T learned how to hustle in 1984. The Bell operating companies, whose purchasing was no longer tied to Western Electric, the Bell System manufacturing arm, began to view AT&T as just another vendor, meanwhile opening a huge new market for other communications-equipment suppliers. In fact, some market analysts insist that most of AT&T's sales last year were of leased telephone equipment installed before divestiture. Major products introduced during the past 12 months include its 3B series of computers and its System 75 PBX and improvements to its System 85. AT&T is also heavily pushing its Unix operating system as an industry standard for multi-user microcomputers. During the first four months of 1984, AT&T was the leading software advertiser in business publications, according to market researcher C-Systems, Ridgefield, CT. In all, AT&T has introduced some 50 new products since it first established a separate marketing subsidiary in 1982.

But as a marketing entity, most observers still believe AT&T has a long trek. "Everybody thought Bell Labs was going to bring out a 100-mile-a-gallon carburetor it had in the basement and blow everybody away; that hasn't happened," says John S. Bain, first vice president for research at Shearson Lehman/American Express at a recent seminar. AT&T Information

Deregulation has, to a degree, meant more regulation.

Systems, the marketing arm that retails directly to customers, continued to grope for an identity, going through its third reorganization in two years. Prospects for Net 1000, AT&T's nationwide data communications network, darkened as Ford Motor Co., Dearborn, MI, rejected a subscription after a trial evaluation. And IBM's acquisition of Rolm Corp. (Santa Clara, CA), the telecommunication manufacturer, means that AT&T will have little time to ponder a marketing strategy. To address its higher-than-average operating costs, 11,000 were laid off at AT&T Technologies, the subsidiary that encompasses marketing, manufacturing, and service. "AT&T is giving some focus to what it's trying to do," says Charles R. Robbins, director of communications services for International Data Corp., Framingham, MA.

Other customers, however, are not so impressed. "AT&T is marketing the System 75 PBX," says William Hegge of Northwestern Mutual Life Insurance. "They told us to sign on the dotted line, but they couldn't deliver the system until the middle of 1985. Rather, they said they'd install an interim system. We'd have had to go through the pains of installing a new system twice."

A year later, the question remains: Will the AT&T breakup work? The OCCs could still price-cut themselves into oblivion. Large corporate users, fed up with the caprices of the local phone company, could decide to set up extensive private networks, provoking the wrath of Congress and the regulators. Bell Laboratories could become a mundane product-development shop. The computer market could evolve into a two-vendor system dominated by AT&T and Big Blue. Maybe the results aren't what's important now. Says Amy Newmark, securities analyst with Cyrus J. Lawrence, a New York brokerage house, "It's possible we'll look back on it all and say at least we gave everybody a chance to fail." □

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READY FOR THE NEXT SLOWDOWN?

The economy is cooling off; are you prepared to protect the last boom's gains?

by David Roman, Associate Editor

The next economic slowdown has already begun. The gross national product was down for the third quarter last year. Housing starts and shipments of durable goods were off, and there was a marked reduction in the private sector's demand for credit. Economists have scaled back their projections for 1985, and some predict that the softening economy will lead to another recession.

Although not felt across the board, a plunge is already in progress, says David Levy, senior economist for Levy Economic Forecasts in Chappaqua, NY. "A recession doesn't begin with a switch being flipped from 'growth' to 'recession,'" Levy says. "It's more like a long train going around a horseshoe curve, where each car represents a different industry." Corporations that are happily rolling along at the back of the train tend to be optimistic—they don't want to accept that a recession is coming, he says.

Robert London, president of the Brandon Consulting Group, New York, takes an even harsher view of the corporate response to today's economic trend. He says American corporations are led by "cockeyed optimists who don't want to plan for the worst. So when the worst arrives, they rely on seat-of-the-pants management."

The worst way to meet a slowdown is to be caught unprepared. While there's no way to predict a recession or how hard a slowdown will hit your corporation, advance planning can help, says Levy. A data-processing department can contribute its resources to a team strategy, but its greater concern should be motivated by self-interest. How can MIS/dp protect itself from recessionary blows, and from the senior and financial managers who are determined to cut back corporate expenses?

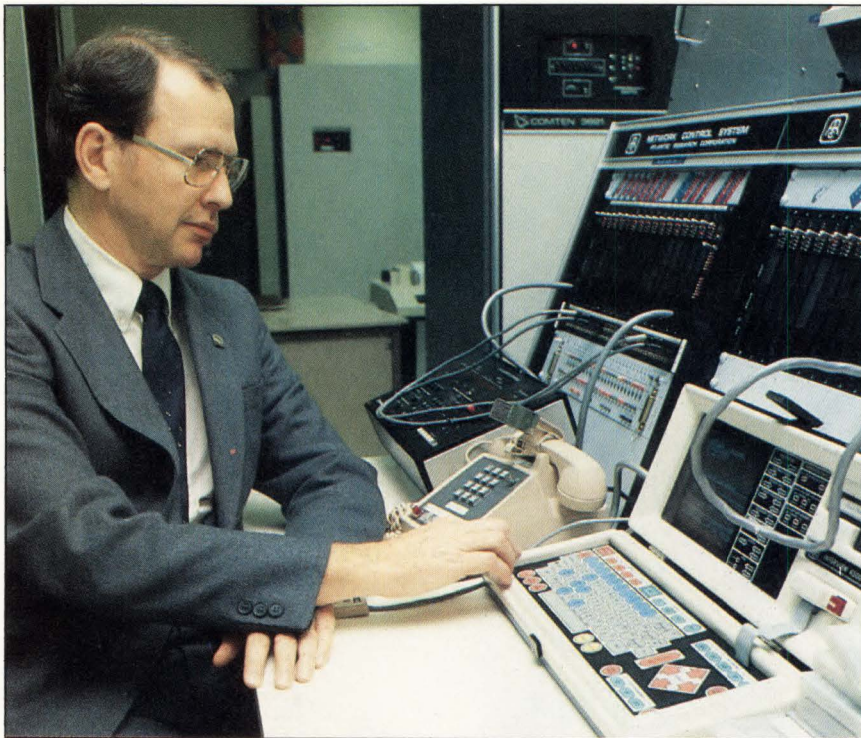
This time, many MIS/dp managers will face tougher circumstances than



Photo by George Mattei



FUTURE SHOCK?



"We have systems that can respond to a downturn in the economy pretty quickly," says Bill Tibbitts, vice president of information, office, and data systems at Whirlpool Corp.

they did during the 1981-82 recession. For example, the information-services division of Carter Hawley Hale Stores, Anaheim, CA, didn't fear budget cuts, layoffs, or project cancellations during the last recession. "This company has an absolute commitment to the use of information systems—in good times and bad," says Vince Conant, the president and CEO of the information-services division. "The last recession hit us while we were completing an aggressive marketing plan. Phillip Hawley [president and CEO] has always recognized that information systems play a primary role in a retailer's profitability. He continued to fund the development of systems planned before the recession."

Other departments rode the end-user computing boom through the last recession. The dp department at Mead Corp., the Dayton, OH, manufacturer of paper and paper products, grew by 30 percent to 40 percent during the last recession due to "the rapid growth of end-user computing technologies," according to John Langenbahn, Mead's vice president of information resources.

Now that Mead's end-user comput-

ing boom has subsided, Langenbahn concedes that his department will be more vulnerable during the next recession. Similarly, Conant of Carter Hawley Hale, allows that he cannot—and should not—expect the same support from the brass to pull information services through the next crunch. The era of expansive MIS/dp growth and unquestioning corporate confidence in MIS/dp services is over. Instead of depending on corporate good will, dp departments will have to find independent means to survive hard times.

There's no single tactic that can guarantee a department's standing in an organization or exempt it from staff or budget cuts during a recession. However, several senior dp managers offer key performance objectives and strategies that they found successful during the last economic crisis and expect to

be useful during the coming slowdown.

While some organizations are able to maintain full staffs during bad times, others are forced to cut back. Ironically, these layoffs can give dp departments a chance to shine. For example, when Mead Corp. instituted across-the-board staff reductions during the 1981-82 recession, the dp department pulled its own weight and also picked up the slack left by a weakened workforce. "Some departments had to cut back their staffs by 30 percent," says John Langenbahn, "but dp managed to pull its own weight and then some, thanks to automation. The electronic safety net was there to catch the work." This efficiency and flexibility didn't escape the notice of corporate management. But Langenbahn stresses that information systems shouldn't replace bodies. Since users can provide a support base for MIS/dp, a rapport with end users should be a primary goal. Corporate users are dp's constituents, so the department has a vested interest in serving them well.

Jack Cronin is the controller of corporate information services at Pfizer Inc., the New York-based pharmaceutical manufacturer. His department has developed a good working relationship with users in different corporate divisions, asserts Cronin. "They're free to talk with us if they have a problem," he says, "and we suggest ways for users to achieve their objectives and for managers to increase productivity and efficiency." At that crucial time of year when the operating division plans its budget, MIS/dp issues guidelines to help departments formulate their annual plans. It's also good diplomacy to volunteer dp's services to other departments, says Cronin.

A good relationship with senior management is also vital, as it helps the senior dp manager become familiar with

"There's a lot of planning a company can do to protect itself from bad economic conditions."

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If your company isn't ready to use any long-term strategies to survive an economic slump and has no other plan to fall back on, you may have to rely on quick-fix measures to cope with a recession. Here are some approaches suggested by Thomas Hannagan, a consultant based in Schaumburg, IL.

- "Take another look at the projects you're working on. Something that was approved by a steering committee a year ago may no longer be important.
- "We've found that 20 percent of the development effort on a project produces 80 percent of the system's benefit. You can get by with that 20 percent by lowering the development cost and reducing development time. Management will be amazed when it sees how fast a project can be done.
- "Take away some of the roles MIS/dp has been playing. The user departments may be able to do much of what MIS/dp once handled, reducing the amount of resources needed for a project.
- "Get rid of the projects you're developing if off-the-shelf software will suffice.
- "Switch some of your projects over to fourth-generation languages."

the rest of the organization's plans and objectives. William Heuser, Jr., director of corporate information services for Abex Corp., a diversified manufacturer based in Stamford, CT, says his rapport with other senior managers keeps him informed. He involves himself with the major projects of each Abex business unit to "ensure that they're making the best business decisions in regard to information services." Heuser disagrees that dp must protect itself from cuts during a recession. "I don't want to be on the defensive," he says, "I want to deliver the most service I can at the lowest cost possible."

Heuser believes the best defense is an offensive strategy. Dp can impress management with a serious, thoughtful, long-range plan, he says. "We found management's attitude changed considerably when we presented a strategic plan," he says. "We demonstrated what we wanted to do, how our plans tied in to the business, and how they'll serve the organization in the next few years. Management willingly supported our plan. This approach is more successful than a defensive strategy."

A long-range plan, formed by consensus, assures the dp department of its role in the organization and the resources it needs to get jobs done. It lets

MIS/dp focus on "managing through the recession," as John Langenbahn says, instead of worrying about where it will be hit next. A long-term plan also lets the department adopt an offensive position. When dp is secure, it can work on reestablishing the entire organiza-



"The electronic safety net was there to catch the work" left by major staff reductions at Mead Corp. during the 1980-81 recession, according to John Langenbahn, vice president of information resources.

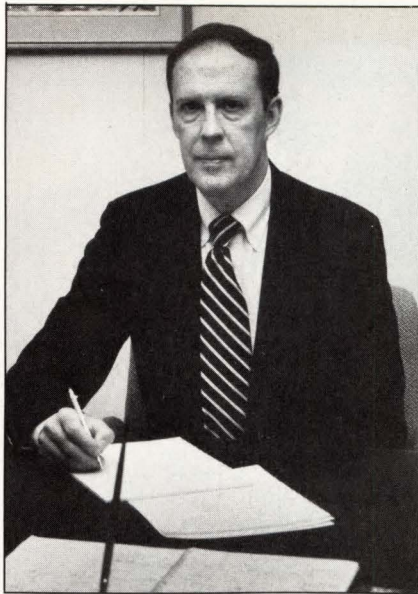
tion's stability rather than just its own.

By continuing to provide efficient services, a dp department can keep one step ahead of disaster. Whirlpool Corp., Benton Harbor, MI, a manufacturer of major household appliances, laid off over 10 percent of its workforce during the last recession. Throughout the crisis, the dp department remained responsive to the organization, keeping it informed and efficient. Because of these efforts, dp's staffing levels remained constant, and the department continued its daily business, says Bill Tibbitts, staff vice president of information, office, and data systems.

Perhaps more importantly, Tibbitts' department predicted the last recession, warning Whirlpool and helping the brass make the necessary adjustments. "We have fairly extensive systems that evaluate sales rates, so we're able to quickly pick up and respond to a downturn in the economy," he says. "Our inventory systems are closely tied to the status of our field products." The department's manufacturing-requirements planning system, its single biggest expense, can also adjust to a lapsing market to ensure that money and personnel aren't used to produce products for which there is little demand.

Carter Hawley Hale also uses automated systems to monitor sales and control inventory levels and sales-related expenses. The dp department tracks sales and reports on how they compare to projections. If projections are off, management can start looking for probable causes and solutions, make projection adjustments, or find ways to economize. Ironically, when sales wane, as they did during the last recession, dp produces the reports more frequently, fueling a greater need for its services.

At both corporations, MIS/dp provided vital information that helped the companies through the last slump. According to William Heuser, this skill is MIS/dp's greatest protection against cutbacks, and it must be cultivated and showcased. By constantly reviewing and refining its services, MIS/dp will become "lean and mean." This strategy not only defies major cutbacks during a recession, it also emphasizes dp's contribution to the organization.



Jack Cronin, controller of corporate information services at Pfizer Inc., believes MIS/dp managers must get every bit of juice out of operations as they can.

Jack Cronin believes "self-examination" is also important. Through self-

examination, dp can earn a favorable position in the organization, he says. "You want to see that you're getting every bit of juice out of your operations," he says.

This soul-searching process should be continuous, says Cronin, but it may be easier to accomplish during a recession. "That's when MIS/dp gets a breather," says Jack Bologna, president of Odiorne International, a management consultancy in Plymouth, MI. "The users' need for programming diminishes due to budget cuts. This gives MIS/dp a chance to get better organized." John Langenbahn at Mead says the last recession forced him to review his setup. He ultimately closed three data centers that "didn't make sense even in good times," resulting in a more centralized dp department.

Some of dp's applications and services may be essential to the corporation, and should be identified long before the dp budget is cut. Setting priorities will protect those operations

that can't be spared, thus simplifying the difficult job of decreasing budgets. However, some of the cutbacks will be dictated by factors that can't be anticipated. "We'll do whatever makes sense during the next recession," says John Langenbahn. He doesn't believe dp is incapable of sustaining cuts.

There are basic objectives that dp must strive for to ensure an estimable position within the organization during a recession. Dp can pull extra weight and respond to immediate and long-term corporate needs by offering the organization its services. If dp protects organizational interests, then the organization will protect dp. Faithful service will result in positive relationships with users and senior managers, essential to surviving a financial crunch. This commitment to superior service—during feast or famine—makes dp a vital, indispensable part of the organization. And that's the best position to be in when the corporation is forced to apply the brakes. □

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ETS IN OA

DO ETs BELONG IN OA?

Can your organization benefit from an "educated" typewriter when more sophisticated devices are just as easily available?

by Dennis Livingston

We have declared war on typewriters," says Dave Hawkins, manager of computer services at Transalta Utilities (Calgary, Alberta), Canada's largest investor-owned electric utility.

Many office managers echo this sentiment. Word processors and personal computers are now easily available alternatives. Yet there are signs that the electronic typewriter, a descendant of the faithful electric, is not ready to join the long march to obsolescence.

An electronic typewriter, or ET, is an educated typewriter. ETs, thanks to their microprocessor controls, automate functions performed manually on electric typewriters, including centering, carriage return, underscoring, and correction. More advanced models with memory can store commonly used phrases and documents, so users can revise material without retyping an entire text. With one- and two-line displays, users can also view alterations before they print.

Electronic typewriters are relative newcomers to office automation. IBM opened the word-processing era in 1963 with its magnetic-tape typewriters. The first commercial display-based word processor appeared in 1972. In 1978 the first desk-top ETs were introduced to the market, at about the

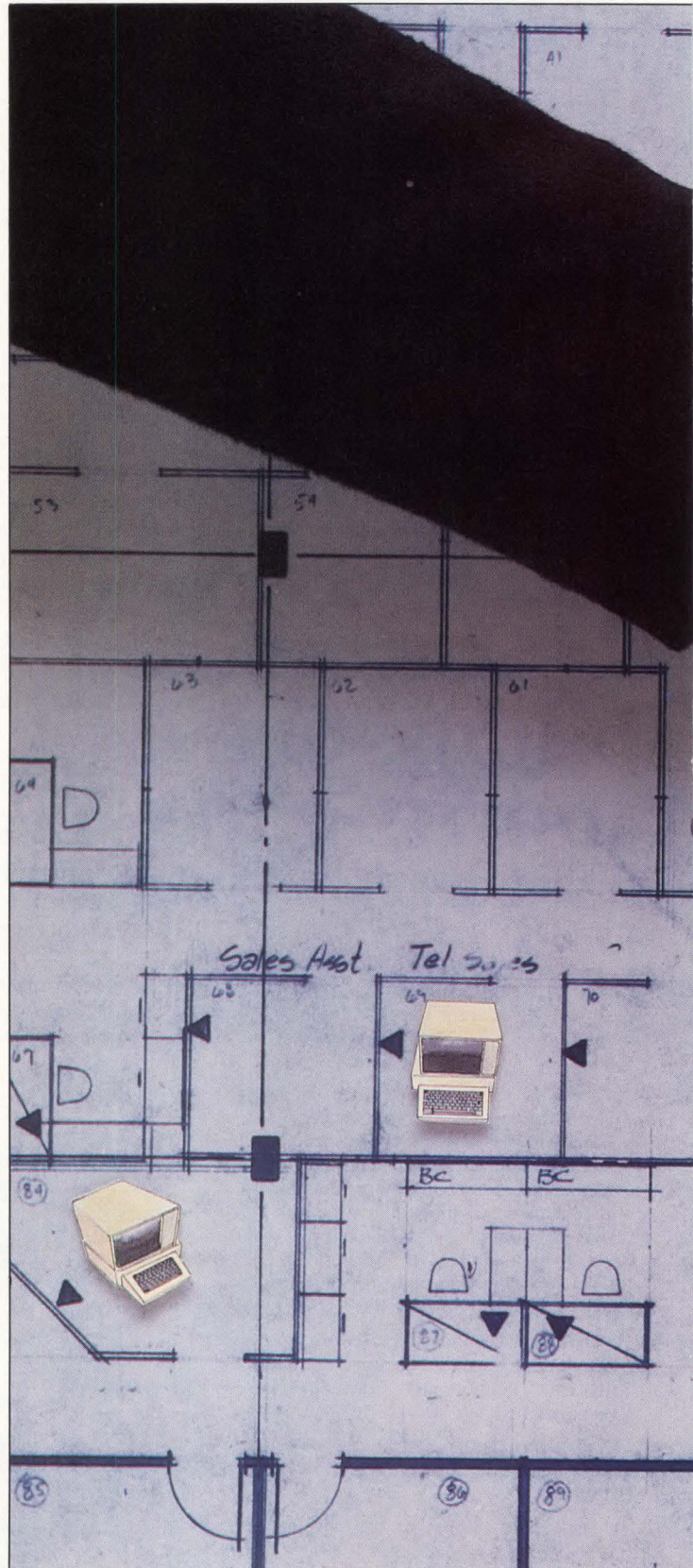
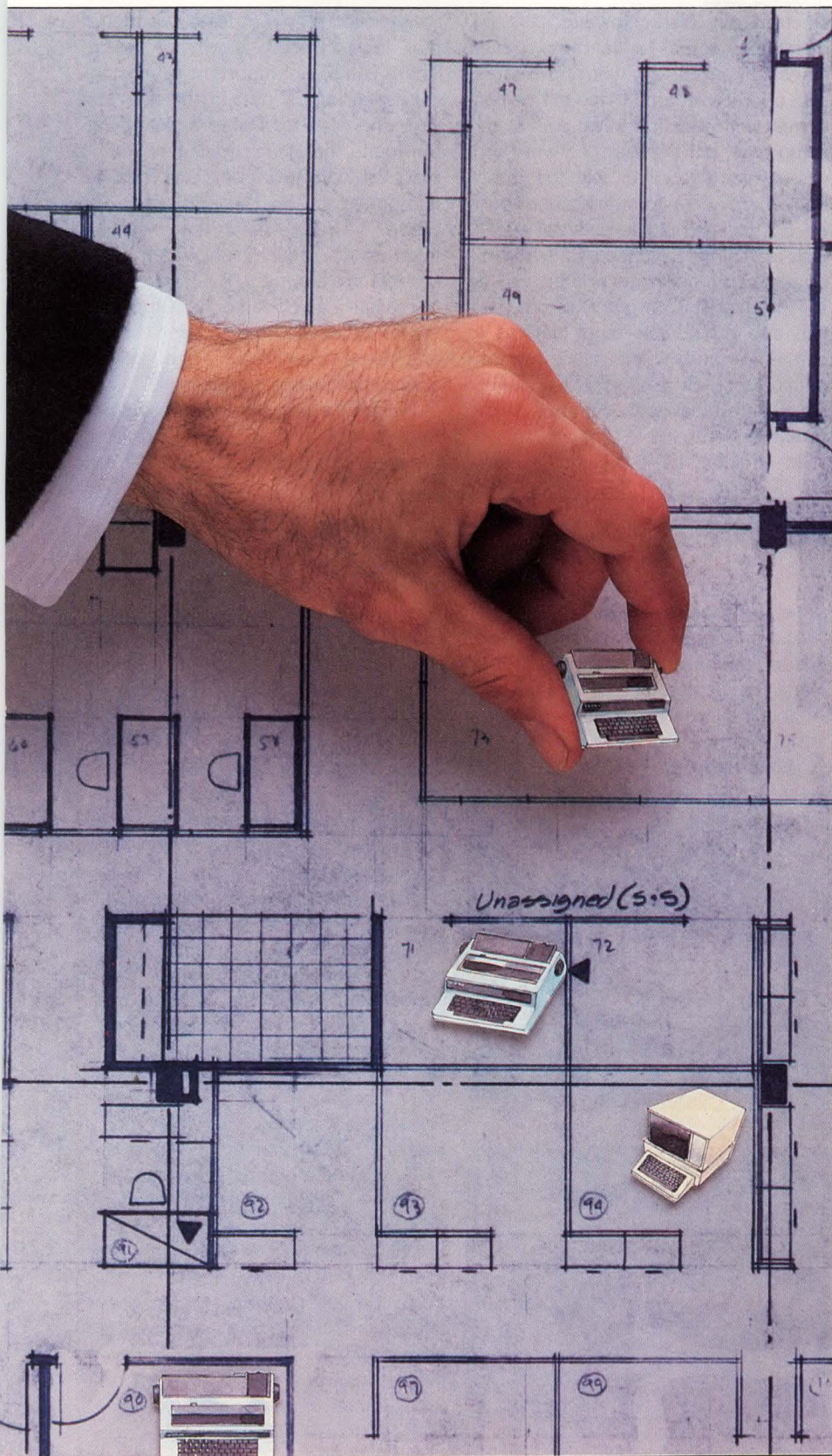


Photo by Rick Barrick



same time as word-processing software packages were announced for personal computers. Today, 28 companies offer over 130 ET models, according to a report from Ken Camarro Associates, a Fairfield, CT-based consultancy.

But has the ET joined the "office of the future" 10 years too late? Why purchase a typewriter with smarts when hardware with more powerful editing functions and memory is readily available? "You need to know your typing needs first, then find the machine that fits those needs," says Anthony Polifrone, executive editor at Buyers Laboratory Inc. (Hackensack, NJ), an independent-testing company for plant and office equipment.

There are several tasks that an ET handles best, according to Nancy Erskine, a research analyst with the Gartner Group, a Stamford, CT-based consultancy. "When you want to type an envelope, a label, an index card, or a one-shot letter or memo that doesn't have to be permanently stored, it's easier to slip it into a typewriter," she says. The ordinary electric can do these jobs, too, but the ET significantly improves the efficiency of even the most mundane operations by reducing keystrokes.

Mary Patton, an assistant editorial analyst at Datapro Research Corp. (Delran, NJ), gives centering as an example. To center material on a page with an electric typewriter, "you have to set the margins, find the middle point, count the words and spaces in, divide in half, go to that midpoint, and backspace half the total spaces in the title to the first letter. With an ET, you push one button."

Patton also points out that clerks with insurance carriers and banks type forms all day. With an ET, they simply insert a blank form, then program the ET to move to the appropriate blanks. Automated features are not the only point of contrast between ETs and electrics. ETs are more reliable because they have far fewer moving parts. They're also a good buy: Basic ETs are available for \$845 or less.

However, the ET does have limita-

tions. Once internal memory has been used, material cannot be added without erasing an equivalent amount in storage. Chips can be added to some ETs to increase internal storage, but eventually the same problem recurs. With a standard ET, users can't readily see how a document will look after it's been revised. And they can't easily use a one-line display for menus and prompts, to switch paragraphs around, or to insert pages. They can't proceed to other tasks while the machine is printing their documents. And there's no room in an ET's memory for a spelling checker.

These tasks must be tackled by a device more powerful than an ET: a word processor. Word processors work best in offices with large volumes of typing,

lengthy documents subject to continual revision, and material that must be electronically filed. However, the ET maintains some advantages, even when compared with word processors. The operator of an ET needn't be concerned with function keys, codes, and setup time, but the user of a word processor must. Moreover, with the proper equipment and a communications port, an ET can double as a letter-quality printer. IBM's advanced ETs, for example, can function as printers for the IBM Personal Computer. Some ETs can also operate as input devices to computers and tie into electronic-mail networks, such as Syntrex' ET-400, which interfaces with Syntrex' word-processing systems.

In addition, ET installation is easy,

training can usually take place at the operator's desk, and the cost of moderately priced ETs is at least half that of the lowest-priced word processor. There is also an important psychological aspect of ET use. In the user surveys she does for Datapro, Mary Patton found that some managers see no place for word processors and personal computers in an "executive atmosphere." They believe the machines take up too much space, and their printers are too noisy. By contrast, Patton says, "The ET looks like a typewriter. It's quiet, doesn't bother anybody, and doesn't make your office look like a word-processing department."

Since ETs and word processors perform complementary jobs, both fit in the same office. Karen Assunto, a con-

AN ET SAMPLER

The Gartner Group rates the five leading ET vendors by market share as IBM and Xerox, tied for first place with 18 percent of the market each, followed by Adler-Royal (15 percent), Olympia USA (10 percent), and Canon USA (10 percent). Competing vendors include Brother, Olivetti, Silver Reed, Sharp, and Hermes.

Major products from the top five include the following:

Last October, IBM introduced the System/2000 line of ETs with 7 Kbytes of memory and optional 24-character display and spelling dictionary in the advanced models. Prices are \$795 (Wheelwriter 3), \$1,045 (Wheelwriter 5), and \$1,295 (Quietwriter 7). IBM also offers the Electronic Typewriter 65, 85, and 95, priced from \$1,495 to \$2,395. The basic model features phrase and text storage with 7,400-character memory, and automatic right margin, centering, underscore, erase, margins, and return. The advanced machines add playout and playback tabs for forms, ability to revise in memory, and 15 Kbytes to 31 Kbytes of text memory. None of these ETs have character displays.

Xerox offers an upgradeable line of Memorywriters with memory capaci-

ties of 946 characters to 15 pages. The Memorywriters also offer automatic carriage return, erase, and forms layout; programmable stops; page replay; communications facility; and 20-character displays. Prices range from \$1,195 to \$2,750.

Adler-Royal produces a variety of

portable and office ETs, with two-line to 4-Kbyte correction memory; automatic centering, decimal tab, indentation, underscore, and carriage return; communications facility; and right-margin justification. The Adler 1035 and 1041 models provide global search, page formatting, 16 Kbytes of text memory (expandable to 32 Kbytes), and 40-character displays. Prices are from \$475 to \$2,995.

Olympia produces many ET models, including Compact, Mastertype, Startype, Professional, Disque, and Mastertext. Features include automatic carriage return, decimal tabs, indentation, centering, underscore, and boldface; communications facility; reverse index; and right-margin justification. Basic machines have one-line correction memory and no displays. Advanced models have 500-character correction memory, 4-Kbyte to 16-Kbyte text memory, and 20- to 40-character displays. Prices range from \$499 to \$2,499.

Canon offers the AP line, with one-line to 500-character correction memory; automatic centering, indentation, underscore, and return; communications facility; and right-margin justification. Advanced models have 15- to 20-character displays and 2-Kbyte to 16-Kbyte text memory.



The IBM Wheelwriter 5.



The Xerox 640 Memorywriter.

sultant with the people/technology programs group at Aetna Life Insurance Co. (Hartford, CT), says that many employees in her department use ETs for typing envelopes and elaborate insurance forms, and word processors for producing and storing long, frequently revised documents.

However, if your organization's tasks are more complex, you should consider several additional options: enhanced ETs, personal computers, and "hybrid" machines, which combine features of both. An ET can be expanded by adding peripherals. A typical enhancement package includes a 64,000-byte central processor, one or two disk drives, word-processing software, and a half- or full-size screen. With these add-ons, the ET becomes a low-end word processor that can handle longer material and continually revised documents. Some enhanced ETs can even run personal-computer software.

Upgrading ETs may or may not be a desirable route, depending on your office's needs. The cost of upgrading approaches that of word processors themselves. As a printer, the ET can't turn out graphics, and it's slow, churning out 10 to 30 characters per second (cps), compared to 40 to 160 cps from high-speed, dot-matrix printers linked to word processors. And add-ons may not help you cope with very long documents in high-volume operations.

Several ET vendors, such as Docutel/Olivetti (Irving, TX), offer add-on packages for their machines. Add-ons that can be hooked up with a wide variety of ETs are available from Lexor

Corp. (Van Nuys, CA), Systel Computers Inc. (San Jose, CA), Olympia USA Inc. (Somerville, NJ), Twix Inc. (Dallas, TX), and Panasonic Co. (Secaucus, NJ). A complete package usually costs about \$3,000, excluding the cost of the ET.

If an upgraded ET's enhanced capabilities are not enough to meet your requirements, personal computers may be the answer. "As professionals start to use computers," notes Erskine of the Gartner Group, "they want to write, use spreadsheets and graphics, and manage databases. As a result, the trend is toward shared-resource, multi-functional workstations." The personal computer comes close to filling the bill, especially with the availability of software that claims to duplicate word-processor functions.

For instance, Multimate International Corp. (E. Hartford, CT) offers software that allows IBM PCs to imitate the popular word processors from Wang Labs., Lowell, MA. IBM has also jumped on the bandwagon with its Displaywrite programs, modeled after Big Blue's popular Displaywriter word processor. Samna Corp. (Atlanta) claims that its advanced word-processing package, Word III, available for IBM, Texas Instruments, and Digital Equipment Corp. personal computers, in operation surpasses even dedicated word processors.

Despite its many attractive features, though, the personal computer is not meant for extensive typing. The keyboard is unsuitable for high-volume word processing, and the personal

"Some enhanced ETs can even run personal-computer software."

computer's operations may require using more complex codes than most nontechnical staff members know. Thus, many corporations combine equipment types to meet their office-automation requirements. At FMC Corp., the Chicago-based manufacturer of machinery and chemicals, professionals use personal computers for drafting documents. Clerical workers type at centralized or distributed word-processing terminals that share filing, communications, and printing capabilities.

According to Lynn White, director of office automation, FMC's office-automation policy is based on using personal computers as multi-functional workstations. There are over 200 computers throughout the company, mostly IBM PCs, and some Wang Professional Computers and DEC Rainbows. Some of the micros are linked to Wang VS and DEC VAX minicomputer systems to perform communications, information-retrieval, document-creation, spreadsheet and analysis, and scheduling functions. High-volume correspondence is turned out at the word-processing center, where peripherals and storage can be shared by linked micros.

At Arthur Andersen & Co. (Chicago), the international auditing and management-consulting firm, the goal of office automation is to improve communications within and between branches around the world. Mark Rosenthal, assistant director of information-systems services, believes standardized, distributed word-processing systems are the solution. He has been considering stand-alone personal computers that can be transformed into word-processing terminals with a single keystroke. These machines have keyboards and software similar to those of word processors, and they can be linked to company networks. (Continued)

LEADING ET VENDORS

Vendor	Product	Price	Circle
IBM Information Systems Group (914) 934-4488	Wheelwriter 3 Wheelwriter 5 Quietwriter 7	\$795 \$1,045 \$1,295	401
Xerox (214) 689-6000	610, 615, 620, 625, and 627 Memorywriters	\$1,195 to \$2,750	402
Adler-Royal Business Machines (201) 964-3200	A range of models	\$475 to \$2,995	403
Olympia USA (201) 722-7000	A range of models	\$499 to \$2,499	404
Canon USA (516) 488-6700	AP 200, 300, 350, 400, 500, and 550	\$695 to \$1,995	405

(Continued from page 125)

Rosenthal also observes that there will always be ETs "in the corner" for tasks that can be accomplished without disrupting computer operations. Other than that, Arthur Andersen never even considered enhancing its ETs as a solution to the consultancy's larger office-automation needs.

"Hybrid" machines are another alternative. These devices combine the attributes of ETs, microcomputers, and word processors. Unlike ET add-ons, their screens and disk drives are integrated with the keyboard. In price, they occupy the niche between high-end ETs and low-end word processors.

One example is Xerox' 640 Memorywriter, which combines an ET-type, 20-cps keyboard, a 20-line crt, and two disk drives, priced at \$4,990. Prototype offers the Display Typewriter, with a 30-line crt but no disk drive, at \$2,995. Similar "hybrids" have been introduced by Lexocorp (San Diego), Minolta Corp. (Ramsey, NJ), and Samanda Office Communications Ltd.

(Markham, Ontario, Canada). DEC's Decmate III provides text-editing, data-communications, electronic-mail, and information-services features, and is priced at \$2,695 (without the printer). Wang's multi-functional Office Assistant costs \$2,395, without peripherals.

Choosing the right office-automation equipment requires careful consideration of corporate needs. James Carlisle, president of Office of the Future Inc. (Hoboken, NJ), believes that if a company just needs to do more typing, ETs are adequate to replace electric typewriters. But, he says, "If you want to automate an office, don't automate typing."

As for Dave Hawkins at Transalta Utilities, his ban-the-typewriter movement is founded on goals of reducing paperwork and simplifying information retrieval. Transalta uses 85 Decmate II word processors, 125 DEC Rainbow micros, and 400 terminals linked to DEC VAXs.

Hawkins bases his word-processing approach on these guidelines:

- The full benefits of technology are

achieved only through integrated functions, including information entry, transfer, storage, modification, and distribution to end users.

- The results of any document manipulations should be visible, especially when the information is transmitted electronically.

- Information should be easily accessible to all who can benefit from it. This requires electronic storage, indexing, printing, and mailing capabilities.

By these standards, concludes Hawkins, "ETs don't fit our office-automation plan."

Which alternative is right for your organization—ETs, word processors, personal computers, or a combination of these—can only be decided after a thorough analysis of office tasks and requirements to accomplish those tasks. Your organization's needs and goals will determine your choice of office-automation equipment. □

Dennis Livingston is a free-lance writer based in Brookline, MA.

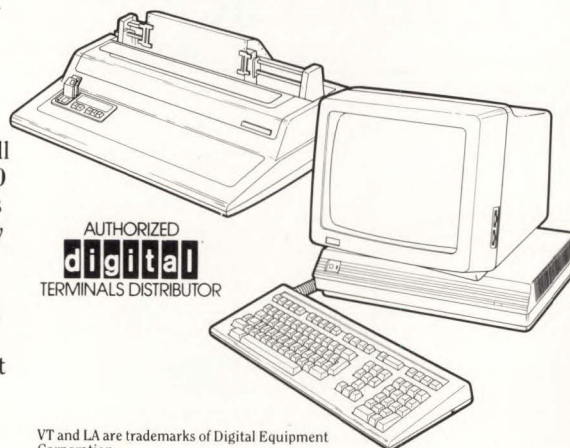
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WHEN YOU INHERIT A HORROR

*Before impressing your new boss,
you've got to clean out the cobwebs
your predecessor left behind.*

by Heidi Waldrop

You've just started a new job, or maybe you've been promoted. You ease back to survey your new domain but before your seat can grow warm, the horror stories of your forerunner's mismanagement descend upon you. "You're rarely going to get promoted into a well-oiled, perfectly running machine, particularly in the technological environment that we're in today," says Dick Byrne, senior vice president of finance and administration for Ducommun Electronics Group, a management unit of Ducommun Corp. that supervises four electronics divisions.

An incoming manager is usually hired to replace someone who has been either fired or promoted. While you may expect to encounter problems when taking over where someone else has failed, it is foolhardy to assume that a position will be trouble-free, even when replacing a successful manager. In either situation, a new manager must be prepared for: unsupportive upper management, hostile users, low morale and high turnover among the staff, a large applications back-



Illustration by Harold Brooks



log, outdated hardware and insufficient software, and the uncontrolled spread of personal computers that aren't fully integrated into MIS/dp. Whatever horrors greet your arrival, your initial task is to sift through the mess, diagnose the symptoms, and discover where the causes of problems lie.

Whether or not you've been given a specific outline of the status of your department, the onus of identifying and locating problems will fall on you—not upper management. Although the inclination may be to jump on the first problem you locate, a "sit back and watch" philosophy will prove more successful in the long run. Joe Izzo, president of JIA Management Group, a Los Angeles-based consultancy specializing in "turnaround management," recommends making no changes the first month. "The new manager should sit back and let the department continue to operate while he or she absorbs all the errors and gaps in efficiency," he says. Taking a cautious approach will help separate the surface flaws from the underlying causes. "Most new managers come in and immediately start holding meetings and taking over," says Izzo. "With that approach, it will take six months to get to the root of all the problems. By sitting back and observing daily operations, you should get a clear picture of the organization within 30 days."

Hugh Switzer, vice president of MIS for Columbia Pictures Industries Inc., New York, has faced inherited problems many times during his career. These experiences have helped him establish a four-step plan to break down and locate trouble areas within 90 days.

First, Switzer determines management's perspective, either before or soon after being hired. "You must find out where management sees the future of the company and how it relates the company to MIS/dp," he says. This can be accomplished through casual conversation and keen observation.

A second resource, according to Switzer, is the users. "You must talk to the users to find out how they view MIS/dp's support services, cost effec-

tiveness, quality, and timeliness," he says.

The third area in this parallel plan is crucial for gathering information on one's own department. "I evaluate everything—from organizational policy and procedures to the personalities of my employees," says Switzer. "I also wend my way through the organization, talking with managers and professionals. I use a lot of different techniques, from formal meetings to visiting the third-shift operators with coffee and donuts. In this manner, I get a very detailed sense of everyone's attitudes and talents."

The initial evaluation serves two purposes, according to Izzo of JIA. "New managers should locate specific problems so they can constructively focus their energies, he says. Most importantly, they should write reports to top management about their findings. In this way, any weaknesses are immediately presented to management, accompanied by the new manager's solutions," says Izzo. "This prevents senior management from assuming all is well, only to blame the new manager six months down the road for problems that he or she actually inherited."

Switzer's fourth strategy is to make a quick overall assessment of any projects already in progress so you, the new manager, can head off potential disasters. "For example, suppose you find that a project that was supposed to be 99 percent finished is only about 0 to 50 percent completed," says Switzer. "Everybody thinks it's going to be delivered within 30 days. Right away you must think of the impact. The head of manufacturing may be in the process of reorganizing his or her department and consolidating four warehouses, all based on the supposition that this new system will soon arrive." According to Switzer, your assessment may turn out to be nothing more than a recertifica-

tion of the original plan, but it may also prevent an impending crisis. Such stop-gap measures are important because they build up confidence and allow management, users, and your staff to listen objectively to a long-term solution.

Having support from upper management is crucial in any situation, but especially for the manager who has inherited a less-than-perfect department. Ed Mueger transferred from another subsidiary to become vice president of information services at Transamerica Interway, a transportation subsidiary of Transamerica Corp., San Francisco. When he arrived, Mueger discovered that data-processing management had been in limbo since Interway was acquired by Transamerica in 1979. The acting manager of dp was a "techie," so all decisions relating to dp had been delegated to an executive user committee.

Fortunately for Mueger, he had the green light from his superiors to make any changes he deemed necessary. "It was crucial that I had access to the right people in the organization," he says. "I needed to report jointly to the CEO level and the policy committee. If I'd only been reporting to a second-line manager, my job would have been impossible. I wouldn't have been able to get close enough to the real issues and senior management wouldn't have been close enough to understand what was going on in MIS/dp. I would have found myself in the position of constantly defending dp."

All new managers would like to receive the same support that Mueger had. But if you're not as lucky, the first thing you must do is win the confidence of your boss. To establish mutual trust, you may need to prove your knowledge and competency to your superiors. In some cases this can, and should, take on the air of a public-relations campaign. Mike Blum, senior manager

in the management-consulting department of New York-based Peat, Marwick, Mitchell & Co. suggests that a grasp of the corporate culture should be a top priority. "Upper management will support you if it trusts you, so you have to get in there and develop that trust immediately," says Blum. "It helps to send out introductory letters to executive management and to hold seminars for users. Most managers stay in the MIS/dp area where nobody sees them for the first six months. It should be just the opposite. You have to be visible."

Your best weapons against hostile users are a knowledge of what MIS/dp is really providing and a willingness to communicate and listen to user problems. Public relations may also prove helpful once you determine whether users' perceptions of bad services are based on reality or a lack of communication. When Dick Byrne joined Ducommun Electronics Group last February, he found disillusionment and anger among both the users and his department. "The users felt that MIS functions weren't providing solutions to their problems. They had lost faith in us," he recalls. "And the MIS department wasn't sure whether it was considered part of the management process or merely looked on as complicated adding machines."

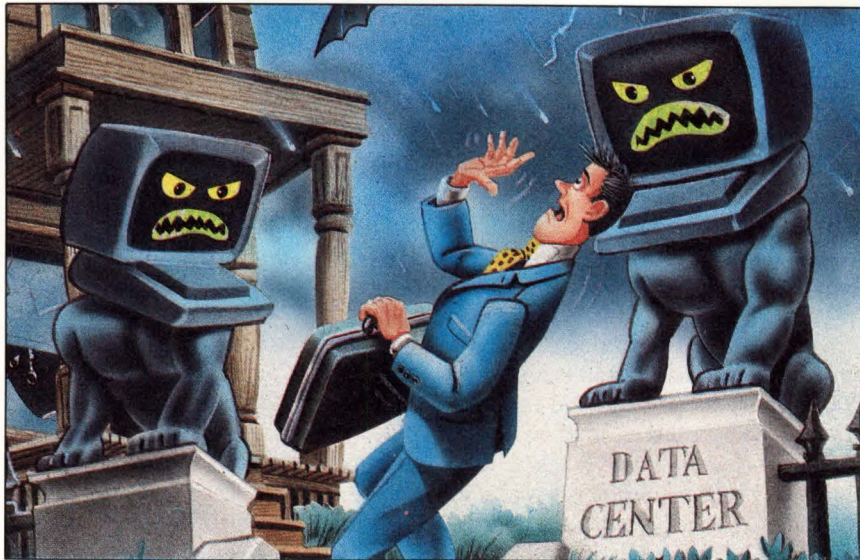
Ducommun wasn't in a state of crisis, but stereotypes that had evolved over a period of years had become institutionalized. Byrne's task was to break that cycle in addition to dealing with problems related to the AT&T breakup, a burst of growth, and upheavals in corporate management.

One reason for the discontentment among users lay in the fact that Ducommun's dp needs had grown to computer capacity faster than expected. "Because of our rapid growth, MIS' ability to serve the user community suffered," says Byrne. "We had to get a handle on that fast." The MIS department had also experienced a number of false starts and had missed deadlines during recent years, so users no longer trusted dp. "We had to figure out where we were going from a hardware, operating-system, and network angle and then try to communicate that to

"Upper management will support you if it trusts you, so you have to get in there and develop that trust immediately."

Blum, Peat, Marwick

BAD LEGACY



the users," says Byrne. "When users know what is happening and what to expect, they're much more forgiving if something should go wrong," he says. "Knowing that MIS is committed to following through helps. We try to outline what we're going to do and when, and then we stick to it."

When Mueger first joined Transamerica Interway, he also faced hostile users. "my first meeting with dp and the users was a 12-hour, knock-down-drag-out fight with everyone trying to lay the blame at someone else's feet," says Mueger. His approach was to become a diplomat. "I had to understand the user's point of view," he says. "And it worked well because the users came to see me as a business person who understood their concerns instead of looking at me as a 'techie' who's always talking computers."

Mueger also improved MIS-user relations by establishing a hotline for problem coordination. "For the first month we got maybe five calls," says Mueger. "But over the next four months there was an average of 75 calls per day. Once users realized we were there to help, the calls flooded in." At first, user problems ranged from a personal computer that didn't work to complaints about late reports and online systems that were unavailable. "Today we are still receiving many calls," says Mueger. "but it's no longer a matter of users just phoning in to complain—now they call for advice."

Relations between the new manager

and his or her inherited internal staff is another primary concern that must be quickly addressed. "If you're going to turn something around, your staff is essential to achieving that goal," says Joe Izzo. "You can't do it yourself. They've got to be behind you."

When a new manager arrives, he or she may confront low morale, high turnover, and an unfair salary scale. It's also common to find a certain amount of resentment or wariness toward the new manager and any new changes he or she might impose. An honest approach will save both you and your staff much heartache. The inclination to lock yourself in a room and come up with a plan all by yourself must be resisted. You'll only lose invaluable input and put your staff on the defensive. "Employees are sometimes afraid to talk to a new boss, but the more straightforward you are about why you're there and what you plan to do, the better your staff will respond," says Izzo. One of the first things his company recommends is that a new manager hold a general meeting for everyone from keypunch operators to managers to explain his or her attitudes and plans.

Although firing holdover employees is an unpleasant task, it should be approached with the same honesty. If you decide it's necessary to reduce or replace employees in key positions, Izzo advises getting it done at the same time. "If you chop off heads over a long period of time, everybody will start to

wonder who's going to be next. This is terrible for morale." Izzo also recommends holding a special meeting to explain the layoffs or firings.

Layoffs engender poor morale, but unfair salaries, a poor management team, and frustrating or unchallenging work can also give your department a bout of the blues. Izzo recommends doing a complete salary and position analysis as early as possible (after the initial wait-and-see period) to ensure that *everyone's* pay is comparable to industry standards.

A new manager must also assess the management team. "You must look at the team's technical competency and leadership characteristics," says Izzo. "You're looking for a team with a high energy level. If members are excited about their work, it will rub off on other employees."

Sometimes, it can be difficult to uncover which employees are dissatisfied with their work. For example, some creative programmers may find much of the daily work mundane but are afraid to voice any dissatisfaction. "Most of the programming these days is maintenance, patching current programs to meet requests from various departments," says Robert Spanvill, president of Delphi Corp., a New York consultancy. "This involves what most sophisticated programmers hate to do—the uncreative drudge work," he says. "And it can drain on their morale." Spanvill offers this solution: "Although dp managers are stuck with maintenance, they can assign each task by personality. You can give certain staffers maintenance 80 percent of the time, and they don't mind it. This frees up the programmers who tend to be more creative." If such a morale problem is ignored, it can cause an applications backlog.

Most dp shops have to deal with some amount of ongoing backlog, but for the incoming manager it can be an especially overwhelming and incomprehensible task. Initially, you must dissect the problem and determine how extensive the backlog is. Izzo of JIA advises that new managers categorize applications requests according to the amount of time they take to complete. "In most installations, you'll find 90 per-

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B A D L E G A C Y

cent of the backlog requests take less than a month to solve. These reports can be kept in one stack. Make a second pile for intermediate-level projects that will take two months to a year, and a third stack for anything over that," he advises.

To further break down the backlog, separate the requests by age. "Anything that is over five months old should be sent back to the user to be reconfirmed. Most of this backlog will turn out to be ephemeral. For example, if 200 of these small, outdated requests are sent back to users, only about 40 percent will ever come back to the manager." Not only will this save time, but the data can be analyzed and organized to be presented at meetings on resource management.

When it comes to hardware and software, a new dp manager must first find out what's on hand. Much like reducing an applications backlog, you'll need facts to back up any requests. This was the situation Dale Lake found when he became vice president of MIS at Wickes Co. Inc. in April 1982. The corporation had just filed for protection from creditors under Chapter 11 of the federal bankruptcy laws, and the MIS department was in a sad state of disrepair. Nobody knew where anything was. The principal data center was in a furniture warehouse, there were many standards and methodology deficiencies, and no quality assurance or systems planning. "After finding out what all the divisions needed from MIS, we did a complete inventory of equipment and software and were able to determine where we were and where we should be," says Lake. Wickes has since consolidated all the various pieces into a state-of-the-art corporate computer center in Wheeling, IL.

Ducommun also faced outdated hardware problems that reverberated throughout the organization. One symptom was that reports weren't getting out on time. "It could have been blamed on anything from the Postal Service to individual employees," says Dick Byrne. "But we discovered that our printers didn't really have the capacity to do the job in a timely fashion, so we had to upgrade the equipment." Ducommun still suffers from a network

that doesn't allow personal computers to interface with mainframes, but this should be solved by this coming spring.

Software problems can be more easily solved once a systems portfolio has been organized. It can and should be done quickly, says Mike Blum of Peat, Marwick. "I would develop an inventory of what systems I have, how old they are, what they're running on, when they were created, and last revised," says Blum. "Then I'd publish it and show it to the dp staff, users, and upper management. It will tell them where you are and what you plan to do about these problems."

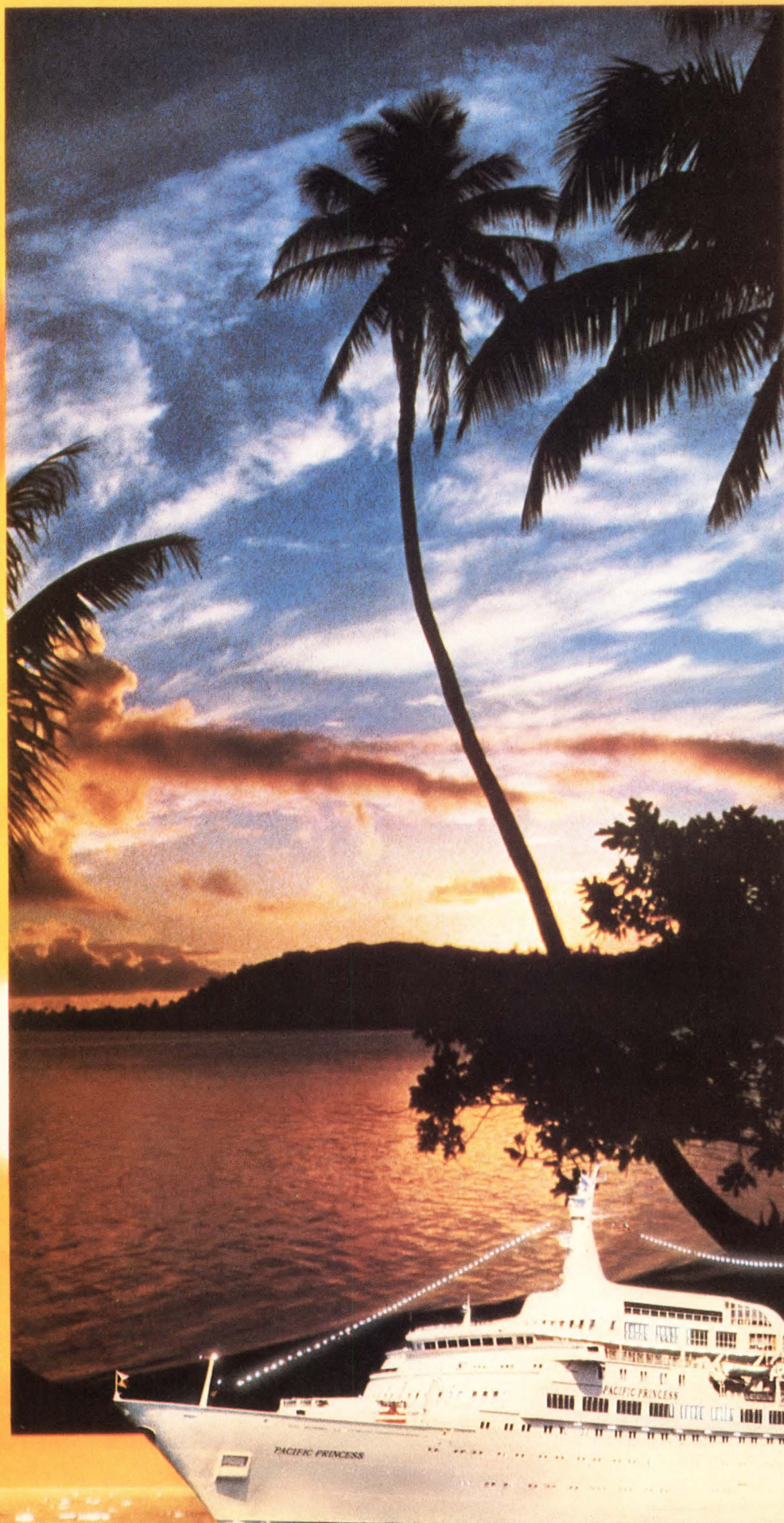
Sometimes all these symptoms can add up to a pervasive problem. Transamerica Interway, for example, had no direction or standardization. "They were totally unstabilized," says Mueger. "Hardware was incorrect and incomplete, the software was incompatible, poor relations existed between users and dp, and the master plan had fallen through the cracks with the acquisition in 1979, as did a lot of documentation."

When Mueger arrived, a proposal was on the boards for additional hardware, which he quickly canceled. "Some managers think you can throw hardware at the problem, and it will go away. Well, it doesn't work that way," says Mueger. "We had to work together to stabilize the environment and set up procedures and standards. In order to accomplish this, we didn't make any upgrades for about a year," he says.

Your first day as new manager may be filled with disaster or sail by without a hitch. While some factors are beyond your control, the moment you greet your subordinates, peers, and superiors, you will be sending out signals. "There's a difference between the manager who comes in with the attitude 'I'm going to improve something' and the new manager who boasts 'I'm going in and take over management'," says Izzo of JIA. Through cooperation, patience, innovation, and a lot of hard work, you'll overcome your predecessor's legacy and transform your inheritance. □

Heidi Waldrop is a free-lance writer based in New York City.

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AVOIDING SHORT-LIVED SYSTEMS

In hardware acquisitions, buying smart may mean leasing your equipment.

by Jeffrey Cohen

Buying computer hardware makes sense—if you don't have to worry about reinvesting in new equipment every few years. In light of the rapid rate at which systems become obsolete, what really is the shrewdest acquisition strategy? Can you make your best deal if you lease from a third-party lessor or directly from a manufacturer? And what is the best move tax-wise? Together, these questions suggest that a corporation's decision whether to purchase, lease, or rent hardware may be as complicated as choosing the right equipment.

Acquiring computer equipment is, in a way, similar to acquiring a vehicle for business use. "Generally, the department that needs the merchandise will get the facts and figures and then turn them over to the financial group, which will make the decision to buy, rent, or lease," says Bill Rummler,

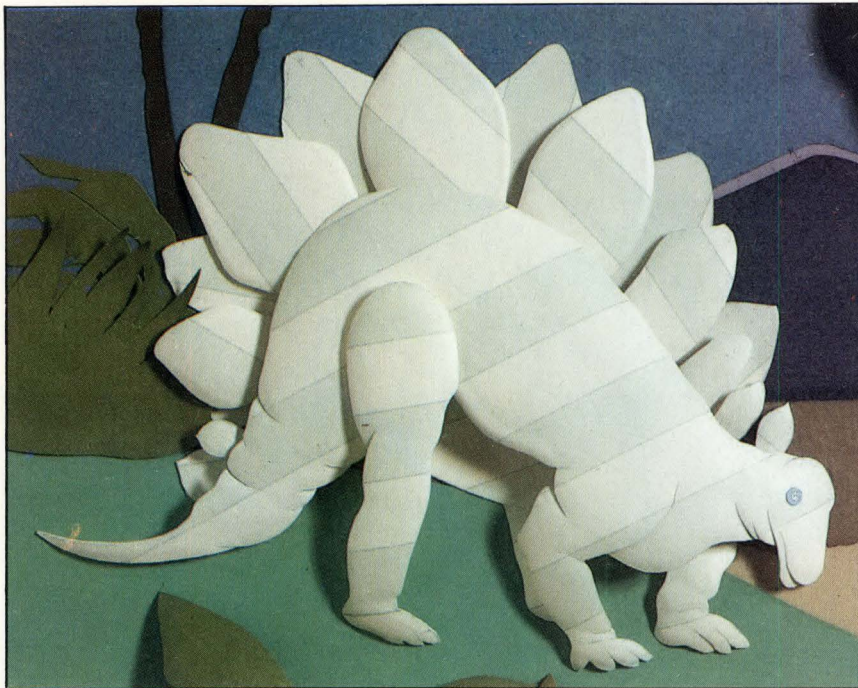
cofounder of Centron DPL, a Minneapolis-based seller/lessor of computer equipment. But that's where the similarity ends. "Unlike computer hardware," adds Rummler, "you don't have to worry about upgrading or adding features to your car to make it more powerful or efficient or to keep it from becoming obsolete."

Just as it is difficult to project how soon computer equipment will become obsolete, it is equally hard to forecast how much it will depreciate in value over the years. "You know approximately how long a car will last," says Kenneth Pontikes, chairman of Comdisco, the big Chicago-based lessor. "You also know its yearly book value. You can't say that about computers."

To avoid being stuck with outmoded equipment that may have little resale value, some corporations are







turning to third-party leasing companies—companies other than the vendor that are in business strictly to lease equipment—as one alternative to purchasing. As revenues of \$5 billion to \$6 billion per year suggest, third-party leasing is catching on as a means by which corporations can keep current with the latest technology without having to invest heavily in new equipment every couple of years.

More often than not, the decision to lease from a third party or from a vendor is based purely on financial considerations. "Before you decide whether to lease or purchase," says one senior purchasing official at General Motors in Detroit, "you have to consider the expected useful life of the equipment, the lease rate, and the residual value for that equipment after the lease expires. At GM we either buy or lease computer equipment—depending on the division and the circumstances—after we do a very complex economic analysis."

For all corporations, economic analysis means taking a hard look at cash flow. When cash is in short supply or needed elsewhere, leasing can keep a large investment off the firm's books. On the other hand, cash-rich corporations looking for investment-

tax credits may benefit by purchasing equipment and writing off the transaction over several years. In either case, the final decision of a corporation's financial honchos may run counter to the recommendations or needs of its data-processing managers. Dan Traxler, marketing-planning manager for Greyhound Leasing in Phoenix, AZ, advises dp managers to "have a heart-to-heart talk with your financial planners. We see it happen all the time: The dp department makes a proposal, and the vice president of finance throws it out the window." Dp managers can help their own causes by staying abreast of those all-important financial considerations.

Once a corporation decides to lease, where to find the best terms becomes problematical. Some see leasing from vendors, such as IBM, as the answer. In the first half of this year, IBM Credit Corp. (IBMCC), Big Blue's financing subsidiary, earned \$425.3 million. That sizable total suggests that lots of corporations lease directly from IBM. According to Svend

Hartmann, president of Computer Merchants Inc. (Armonk, NY), the emergence of IBMCC has had a positive effect on leasing in general. "IBMCC has brought respectability to the idea of leasing," he contends.

Before choosing between direct and third-party leasing, managers should have a clear sense of what the corporation expects of the transaction. If a corporation is looking for a longer-term lease—usually five years—so as to distribute its payments over time and lower its yearly interest rates, it should probably lease directly from the vendor. In fact, it may be forced to. "It isn't financially feasible for a third-party lessor to write a five-year lease with a low annual rate," says Dan Traxler of Greyhound Leasing.

However, the rapid rate of change in technology makes long-term leases almost equivalent to purchase contracts. Leasing fails as a strategy to avoid obsolescence when terms are long and rigid. Flexibility is the secret of this game. "Long-term leases increase the risk of obsolescence," says Lou Aull, assistant manager of information services for the American Association of Equipment Lessors, Washington. "If a corporation wants to maintain a leading edge in technology, it must consider short-term leasing."

The annual rates for short-term leases, which usually run for two to three years, are higher than those for long-term leases. But, notes Bill Rummler of Centron DPL, "if a lessor takes the investment-tax credit for the equipment it purchased, it can reduce the monthly rental in an amount equal to the investment-tax credit."

Lessors may, in part, finance their equipment purchases on the good credit of the lessee. After taking extensive financial information from the applicant, the lessor brings the contractual agreement reached with the lessee to a lending institution, which

"The decision of the financial department may run counter to the recommendations and needs of the dp department."

then lends the leasing company a portion of the money it needs to buy the equipment based on the lessee's ability to meet the contract's terms. The lessor contributes the balance. The result could be lower rates for the equipment.

Whether a corporation chooses a long- or short-term lease, it should consider both how it plans to upgrade its equipment and what it plans to do after its lease expires. Some lessors, such as Centron DPL, include upgrades as part of the lease. Others allow users to return equipment before the lease expires if an upgrade is needed. What happens when the lease ends? Buying the system would seem to be a logical next step for users. However, most users will find it difficult to obtain an option to buy equipment at the end of a lease. "In most cases, lessors avoid writing a lease with the option to buy," says Rummler. "If the lessor takes the investment-tax credit for the equipment he or she purchased, by law he or she can't sell that equipment above fair market value. The lessor may be putting quite a lot of money into the transaction, and if he or she doesn't want to include an option to buy, I can't say I'd be surprised."

However, fair market-value buyout—a term derived from a clause written into a lease that allows the lessee to purchase equipment when his or her lease expires at a price determined by a party other than the lessor or lessee—does not always favor users. It doesn't take into account the amount of money the user has already spent on the equipment through leasing.

Issues like buyouts, mid-lease return of systems, interest rates, and upgrades after a number of payments are all open to negotiation. The details can be worked out in the lessee's favor if management has sweated them before approaching lessors. Also, the involvement of both dp and financial managers will be vital to the suc-

cess of negotiations.

If a corporation finds long- and short-term leasing unsuited to its needs but still hopes to avoid a hardware purchase, it might find renting to be a good stopgap strategy. Renting generally refers to very short-term leasing. Many users and vendors agree that rented equipment is best used as a stand-in until purchased equipment is delivered or until users have determined whether or not they like a particular system.

For users who demand flexibility or who do not want to commit a large amount of capital to an unproved system, leasing and renting have definite advantages. But for users who, according to James Benton, executive director of Computer Dealers and Lessors Association (Washington), do not have to worry as much about obsolescence, purchasing may be the better option.

Purchasing allows cash-rich corporations to take investment-tax credits for equipment while avoiding having to pay the interest rates lessors impose. "If a corporation finds that it can save more money by investing in its own computers," says Svend Hartmann of Computer Merchants, "clearly it should do so."

But what about obsolescence? Some corporations, especially large ones, can absorb obsolete systems. Large corporations can move obsolete equipment from a division that requires "leading-edge" equipment to another that does not. Purchasing works well when an organization has such options. According to Peter Crowell, director of corporate systems for International Creative Management, a large New York-based talent agency, quickly changing technology was not weighted very heavily in his employer's decision to purchase its hardware. "Because our companies are not as vulnerable to changing technology as others," says Crowell, "we have the advantage of being able to pass along our

equipment."

However, cautions Charles Powell, account-marketing manager for Storage Technology Corp., the big mass-storage vendor based in Louisville, CO, purchasing is suited to some products more than others. "A tape drive is one of those products you're going to keep," says Powell, "and you can always use a printer somewhere. But when it comes to deciding whether to buy a disk drive, you have to make a long-term decision because the technology is changing so rapidly. If you're thinking about keeping your equipment for five to seven years, you might just as well flip a coin. If you get stuck on a lease, all you can lose is the time it takes to convert your equipment. If you get stuck on a purchase, you can lose big dollars. I'd recommend looking at trends in product types and then trying to project your product's life cycle."

A product's life cycle will affect its value on the used- as well as the new-equipment market. Whether users lease their equipment, buy new hardware from manufacturers or from independent retailers, or purchase equipment that was previously owned or leased from used-computer vendors, they must usually consider the age of the model before the age of the equipment. If used equipment was introduced more than three years before its sale date, it will be considered almost obsolete in most cases.

But does that always mean that used hardware is less expensive to buy or lease than new hardware? As most users would suspect, usually the savings are substantial.

Choices, choices. Every acquisition users make must take into account the dp needs and financial strictures of their organizations as well as the rate at which technology changes. As the used-equipment market and third-party leasing emerge as competitive alternatives to direct purchasing, managers will have more of an opportunity and more of a responsibility to strike the right balance between their acquisition strategies. □

Jeffrey Cohen is a free-lance writer based in Wallington, NJ.

"Once a firm decides to lease, where to find the best terms becomes problematical."

EXPERT SYSTEMS GET DOWN TO BUSINESS

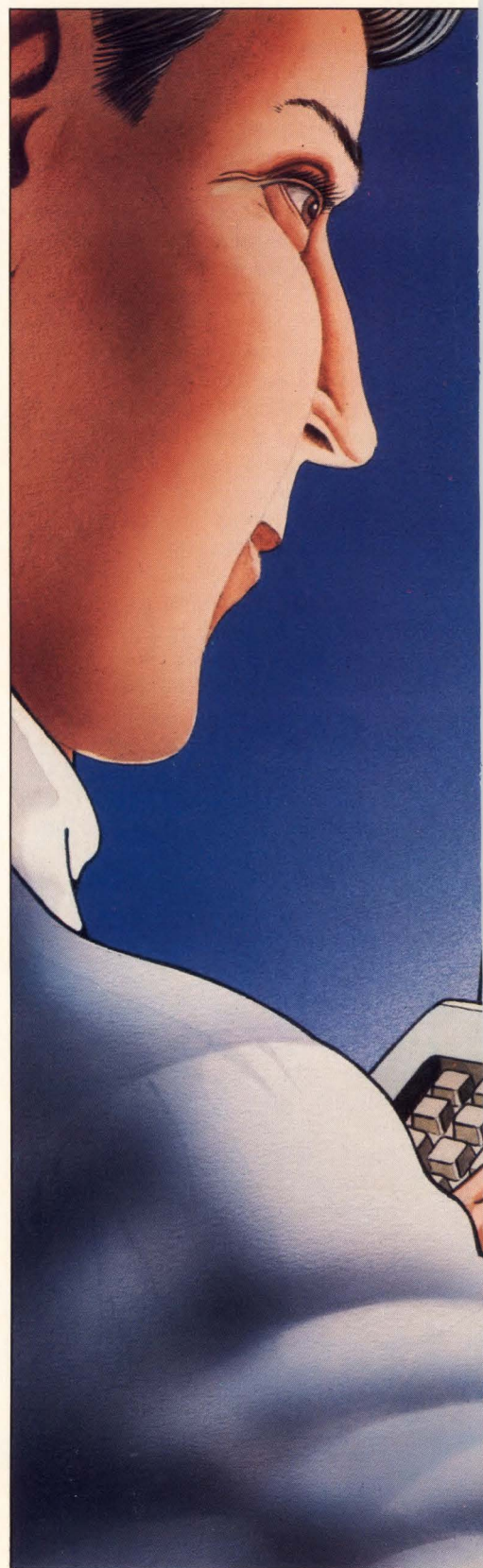
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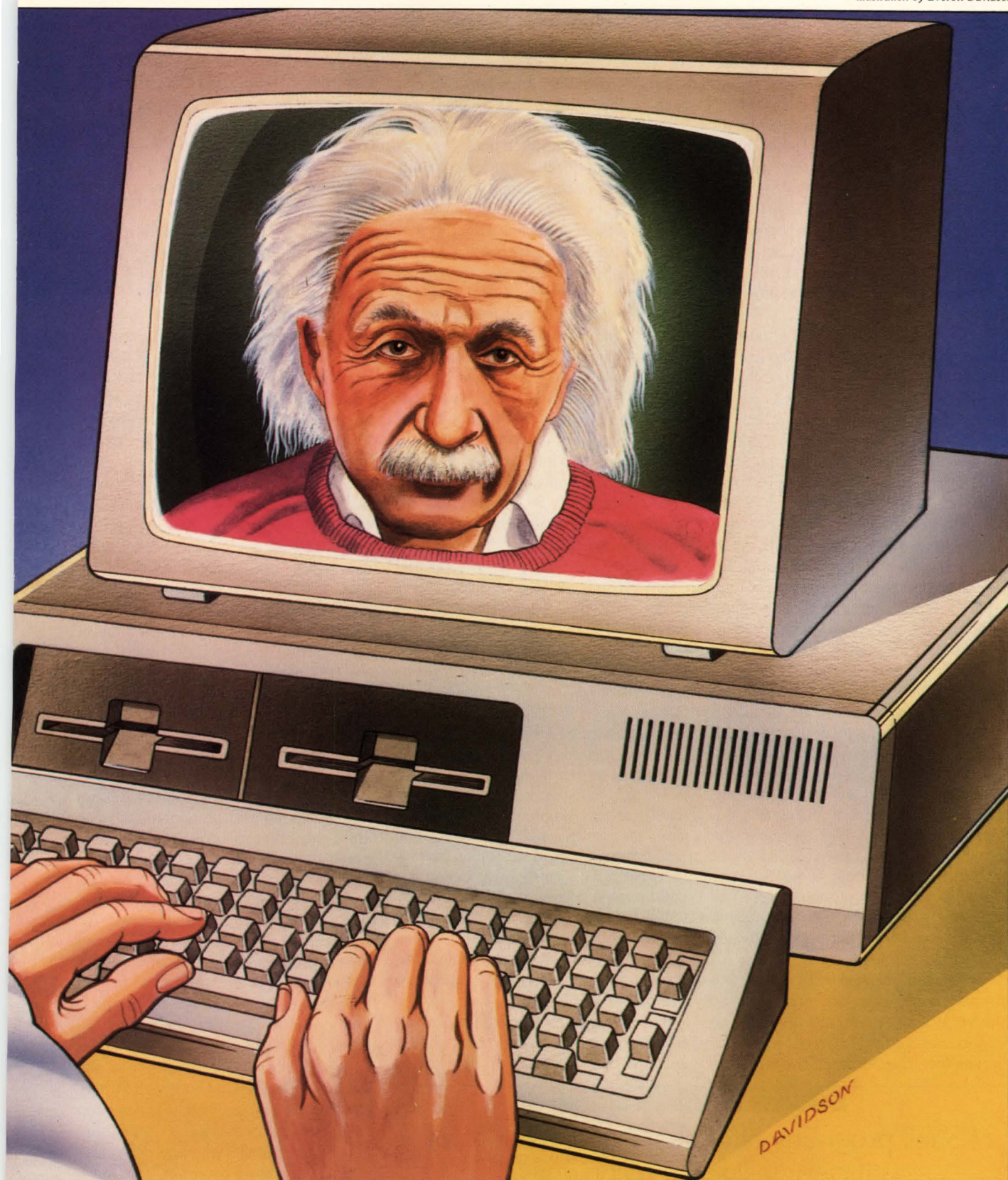
by Anne Lampert

Expert systems, the ability of certain computer systems to mimic human reasoning, were born and nurtured in the esoteric realm of academe. But, this promising—if immature—technology has begun to make its way into the rough-and-tumble world of commerce. Expert systems are programs or sets of programs designed to multiply the value of real experts by putting their knowledge at the fingertips of nonexperts. Guiding users through extremely complex problems in plain English, expert systems are used to support decisions in sales, marketing, management, training, design, and fabrication. And their potential for widespread use is multiplying with their increasing availability.

There's actually a hierarchy of expert systems. They range from highly sophisticated systems built through years of effort to custom-built applications from AI software vendors to micro-based "shell" programs that offer fill-in-the-blanks shorthand versions of artificial-intelligence (AI) techniques. Shell programs allow more organizations to foray into AI programming.

Digital Equipment Corp., Maynard, MA, has the largest commercial expert system in daily use. R1, also known as Xcon, is a classic example of an expert system applied to a trial-and-error process: tailoring VAX minicomputers to order for large computer systems. Xcon generates a set of diagrams showing where one DEC VAX mini-





computer should be positioned relative to another.

According to Arnold Kraft, manager of external relations at DEC, "There are fewer changes in orders configured by Xcon than in orders configured manually. Xcon gets it right the first time." DEC teamed up with Carnegie-Mellon University, Pittsburgh, to build Xcon and two other expert systems, Xsel and Xsite. Employing a query-and-answer method, Xsel helps DEC's sales representatives prepare quotes on computer systems for prospective buyers. Xsite matches the users' physical environs with the hardware the customer requests.

Expert systems like DEC's trio perform mind-boggling logistics and are expensive to build. But they are actually quite simple. They include two components: the knowledge base, which incorporates the knowledge of an expert or group of experts in a specific area; and an inference "engine" that uses rules of reasoning (heuristics) to interpret the information in the knowledge base and arrive at conclusions. With these expert systems, a complex analysis can be completed in a matter of minutes or hours, something that might take a mere mortal—expert or not—days, weeks, or years.

No one claims these top-of-the-line expert systems are infallible, but they're certainly unflappable. Although there's no guarantee that an application's results will be absolutely correct, the best diagnosis will be made considering the knowledge base in the system. To prove its point, the expert system leaves a trail of the "reasoning" the inference engine followed in its quest for a conclusion. Some expert systems will even explain why they rejected alternative conclusions. In this respect, expert systems retain a specifically human touch.

In oil and mineral exploration, extremely costly decisions are made on the basis of large amounts of data—an expert system's bailiwick. Schlumberger Inc., the Austin, TX-based subsidiary

of the French oil-exploration conglomerate, uses Dipmeter Advisor, its first expert system, to supplement the scarcity of highly qualified geological analysts. The Dipmeter Advisor interprets readings from instruments deep in an oil-drill hole, called dipmeters, to determine the amount of oil reserves at a given site. It analyzes data on geological formations and verifies their accuracy. Based on the Dipmeter Advisor's conclusion, Schlumberger advises oil-well owners on whether to pursue or write off an operation.

The Dipmeter Advisor represents somewhere between eight and 20 years of work by programmers trying to clone the knowledge of experts. It was put together in a team effort with Fairchild Artificial Intelligence, Mountain View, CA. Schlumberger's engineering center estimates that its expert system can interpret dipmeter readings as well as a junior geologist about 90 percent of the time.

SRI International, a nonprofit research and consulting firm in Menlo Park, CA, working with the U.S. Geological Survey, built a similar system, called Prospector, to advise field teams during mineral exploration. And—eureka!—Prospector predicted a deposit of molybdenum in the Cascade Mountains in northern California—a find expected to yield over \$100 million.

These success stories are indicative of the types of problems sophisticated expert systems can solve. But, their development is expensive and time-consuming. Expert systems like the ones serving DEC and Schlumberger are not usually built by an organization on its own, because a considerable amount of specialization—both in AI programming and the subject matter of the system—is necessary to the process. Clearly, only a few corporations can undertake similar development efforts.

However, users have other, less expensive, options. Customized expert systems can be bought from software

vendors that specialize in AI, or organizations can build less complex expert systems with micro-based "shell" programs. Applications development requires the use of one of the AI programming languages—Lisp or one of its variations, or Prolog or one of its variations—so the user can direct the computer in English and be likewise answered. And, processing the programs requires either special hardware or a cross-compiler.

For complex applications, like diagnosing computer malfunctions, Lisp is more likely to suit the purpose. The Dandelion Lisp processor from Xerox Corp., Stamford, CT, has a stripped-down price of \$22,000—easily the least expensive Lisp machine available. By comparison, the lowest-priced Lisp processors from Symbolics Inc., Cambridge, MA, and Lisp Machines Inc. (LMI), Los Angeles, cost about \$69,000.

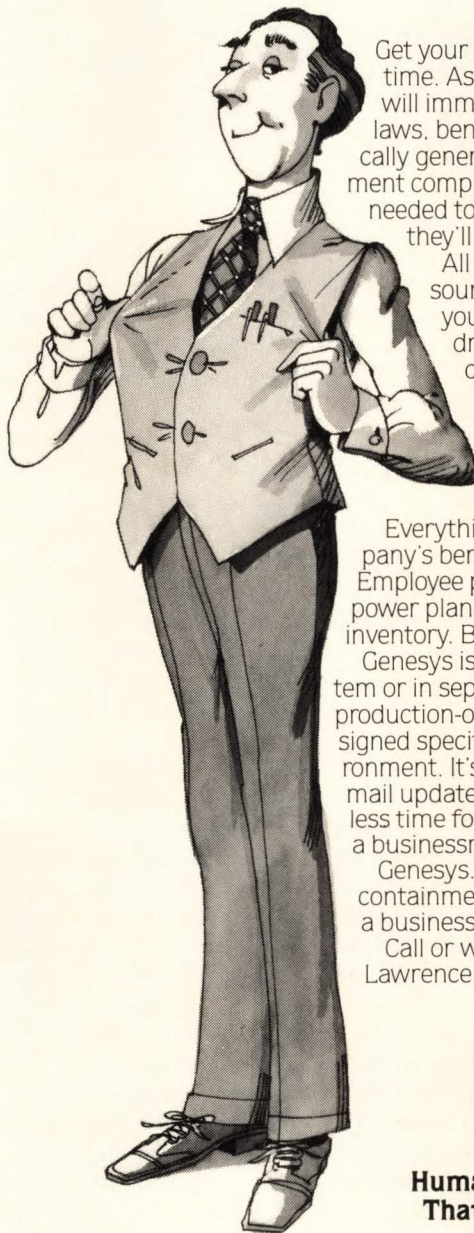
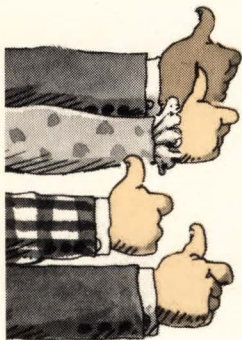
Shell programs are relatively inexpensive expert-systems-development packages. With these and a bit of AI language proficiency, an organization can make a relatively low-risk investment in expert systems before contemplating a major development effort.

Three micro packages from Human Edge Software Corp., Palo Alto, CA, are typical of these stripped-down expert systems. They're not nearly as sophisticated as a system like Dipmeter Advisor, but they give managers a taste of artificial-intelligence techniques. Degree of sophistication and price vary. Negotiation Edge, Communication Edge, and Management Edge are designed to run on IBM and Apple personal computers, and cost from \$195 to \$295 each. These programs can aid users in outwitting a sales prospect, boss, negotiating opponent, or subordinate. The reports generated by these programs are answers about what responses the user may expect from Mr. or Ms. X, based on the facts and opinions the user feeds into the knowledge base.

Jack Hildner, vice president of the Beverage Packaging Division at American Can Co., Greenwich, CT, has been using Management Edge, as have users in his department. "Management Edge is an informative program," he says,

"Shell programs offer shorthand versions of artificial-intelligence techniques."

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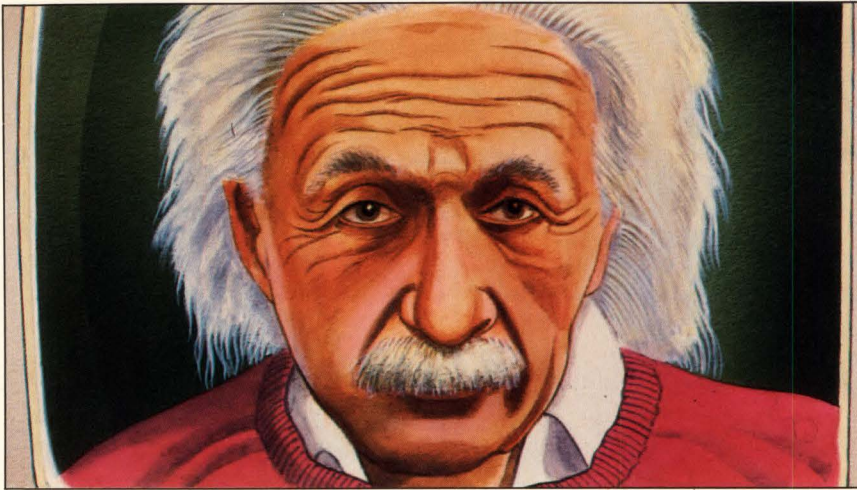
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Expert Software International Ltd., a Scottish company with American headquarters in New York, takes a different approach. Expert-Ease differs from other expert systems in that once the user has stocked the knowledge base with enough information, the program itself formulates an inference engine. The program also allows users to ask questions. Expert-Ease costs \$2,000, and runs on the IBM PC and compatibles and DEC's Rainbow. A memory-limited demonstration version of Expert-Ease is available for \$125.

Dr. Evlin Kinney, assistant professor of medicine at the University of Miami (FL), has been using Expert-Ease at the Veterans Administration Medical Center in Miami to determine the significance of patients' chest pains. Kinney built the knowledge base with data from actual patient histories and let Expert-Ease come up with the inference engine. "Since chest pain may have many causes, it's often very difficult to isolate the particular condition affecting a patient. My colleagues may ask dozens of questions about a patient, whereas Expert-Ease suggests that only 10 of these are truly signifi-

cant. The system helps us narrow the possibilities," Kinney says.

John McGann, a consultant at Input Inc., a consulting firm in Mountain View, CA, sees Expert-Ease as having great potential for marketing applications. "Consumers ask many questions when deciding on big-ticket items, such as washers and dryers," he says. "The retailer that has an expert system can help its buyers make decisions." McGann predicts that expert systems may be used effectively for everything from selling real estate to planning corporate strategy. It's not hard to see how expert systems could be applied to MIS/dp purchasing decisions. After all, there are always many variables and alternatives to consider.

Another alternative is the Knowledge Engineering Environment (KEE) from Intellicorp, Menlo Park, CA. KEE has the building blocks for a fairly sophisticated expert system. The screen display utilizes windows and rules to outline reasoning, and information entered into the knowledge base is grouped in hierarchical structures, showing several levels of relationships between facts. KEE is designed to promote the rapid building and refinement for prototypes of systems and software. KEE costs \$60,000 for the first unit, and less for subsequent purchases.

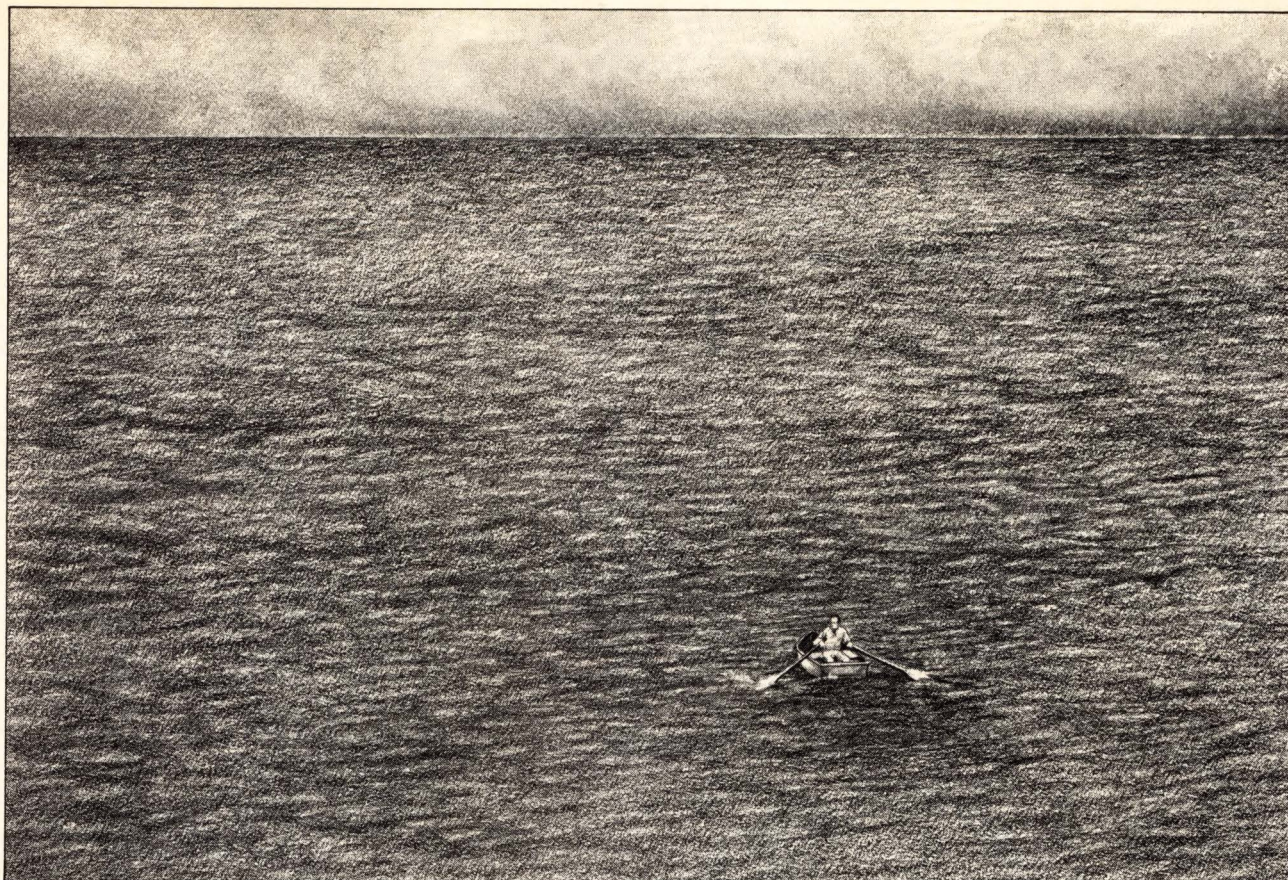
At Ford Aerospace and Communication Corp., Detroit, MI, KEE is being used to help earthbound operators diagnose and correct satellite malfunctions. Over a year ago, without KEE, the Space Mission Group at Ford tried building its own expert system to aid Ford's engineers and operators, but found the project overwhelming. Then the group decided to use KEE. It designed a system that tells operators the consequences of rejecting the system's advice and provides a trail of reasoning supporting each conclusion.

Another user of KEE is Arthur D. Little Inc., the Cambridge, MA, management consultants. In one case, KEE was used to build a simulation package to aid engineers during the design and testing of factory-automation projects. In another, KEE was implemented by the marketing manufacturer of an optical-systems company for the design of equipment tailor-made to customers' specifications. KEE cuts down substantially on design time and the pricing process.

Still another software package available for expert-systems development is from Inference Corp., Los Angeles. Automated Reasoning Tool (ART) features displays of the reasoning process during analysis. ART displays its evaluation of alternatives and plots where each course of action will lead. One of the test sites for ART is the National Space and Aeronautics Administration's Johnson Space Center in Houston. Abraham Gutman, Inference's marketing expert, says, "Using ART, we developed Navex, a system that processes information about the space shuttle's orbital position from radar signals. And it does it within milliseconds. Three operators used to perform that function."

Navex, or Navigation Expert System, requires little training to operate, says Robert H. Brown, chief of applications and technology at the center. Navex runs four to eight times faster than necessary to plot the position of

"An expert system's conclusions can represent the best of all possible solutions."



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satellites, says Brown, and the extra time has enabled engineers to plot the shuttle's course more closely.

Then there are integrated shell systems: expert systems that run on office micros and can tie into corporate databases. Silogic Inc., Los Angeles, makes The Knowledge Workbench, which in-

corporates a knowledge base, inference engine, natural-language interface, and universal database interface. Knowledge Workbench is designed for use on 32-bit microprocessors—such as the IBM PC AT, Apple, and the NCR Tower—and its database interface allows users to interact with corpo-

rate databases. In this way, historical data, as well as the expert knowledge base, can be accessed for decision-making. Knowledge Workbench is scheduled for release in the first quarter of 1985.

Arby from Smart Systems Technology, McLean, VA, helps designers write diagnostic systems for electronic equipment. Arby's inference engine operates on the users' conventional database system. The system costs \$9,000.

If you are considering an expert system, remember that its success depends on the appropriateness of the applications. It should be used for applications and problems that only a highly skilled expert can resolve. According to Patrick Winston, professor of computer science at Massachusetts Institute of Technology, Cambridge, technology is not the issue when purchasing an expert system. What must be considered is whether applications will be worth the cost of development. The hours required to develop an expert system and the constant enhancements necessary to maintain an updated knowledge base make payback especially important.

Can expert systems replace human experts? Says Dr. Rainer von Konigslow, technical director of Logicware, "The human expert will have to control the expert system for it to function effectively. The intelligent use of AI will not replace experts, but enhance what they do best by making their talents available to a much broader range of businesses more quickly—and probably more economically—than ever before."

Thus Xcon hasn't left DEC's system-order reviewers with nothing to do. Although they no longer prepare system layouts themselves, they review the first page of the layout to determine if Xcon has erred. It rarely does.

This points to the recurring theme in expert-system implementation: The expert system does not supplant human involvement in the problem-solving process. The system merely makes the problem-solving more efficient and accurate. ☐

Anne Lampert is a free-lance writer based in New York.

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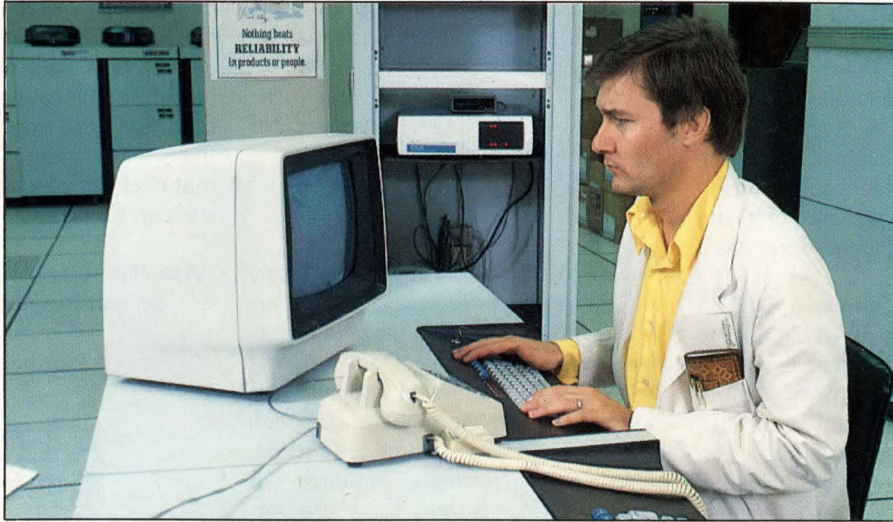
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RCA CYLIX WINS A VOTE

The RCA Cylix satellite-based data-communications network has increased uptime to better than 99 percent at Lamar Corp., a large outdoor-advertising company headquartered in Baton Rouge, LA.

Until RCA Cylix took over network operations in December 1982, Lamar leased three 1,800 bits-per-second lines from AT&T Communications to link terminals and printers at 20 locations scattered throughout the country to a Burroughs 1835 mainframe. The network was up only 70 percent of the time with the AT&T lines. "It was not unusual for one of our Florida offices to be down for two weeks," says Chuck Barkow, data-processing manager for Lamar Computer Services, a division of Lamar Corp. Barkow's department provides all data-processing services for the corporation.

Not only did Lamar's operations suffer because of so much downtime, but getting repairs made was also a prob-

lem, says Barkow. "We'd call AT&T, and it would check the line and determine that it was a modem-to-terminal problem. We'd call in the modem- and terminal-servicing companies, and they'd discover that the problem was really in the phone line," he recalls.

When Lamar expanded its operations to 29 plants in 12 states, it had to convert its system from batch processing to online processing. The company's Burroughs 1835 didn't have enough speed or memory to meet Lamar's online-processing needs. Barkow decided to replace the 1835 with the more powerful Burroughs 5930 and tackle the data-comm problem at the same time. Barkow decided to switch from AT&T to RCA Cylix because Cylix offered single-vendor, end-to-end support at a price comparable to AT&T's. The conversion went smoothly. RCA did most of the work needed to convert, says Barkow, including installing modems and arrang-

ing for required land lines.

The initial installation cost \$7,400. The mainframe supports 27 terminals and 27 printers at 26 plants, as well as 33 onsite terminals and printers. A single host line to Cylix' remote earth station in Houston transmits at 9,600 bps, and remote-site speed is 4,800 bps.

Lamar pays about \$15,000 per month to transmit 180 million characters with Cylix, a price that includes all charges for host lines, characters transmitted, and modems. The cost of the AT&T network was about the same.

Barkow is pleased with the performance of the RCA Cylix network. "RCA's service is second to none," says Barkow. "Its personnel are very responsive—they're not afraid to help out. If you have a problem and you're not sure if it's data-comm-related, they'll help determine just where the problem is. If it's anywhere between the front end and a remote modem, RCA Cylix handles it." **Circle 416**

LETTERS

ETHICS AND MIS

"Ethics" (October) cannot be legislated, cannot be controlled by a code of conduct, and certainly cannot be "certified," because competence (presuming certification is a valid measure of it) and ethics are not contingent upon each other.

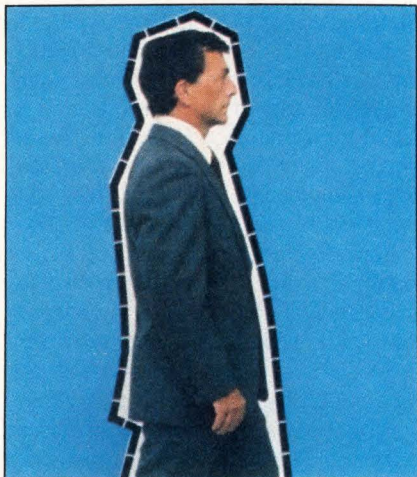
Gerald Hoffman, Standard Oil Co., seemed to be the only panel member to view the issue from a practical, reasonable, common-sense viewpoint.

Company policies and individual moral character govern ethics. Our company policy on confidential information is simple and workable: Anyone knowingly violating rules of confidentiality is subject to immediate termination.

F.J. Bridge

Vice President, Information Resources
Mineral Processing Systems Inc.
York, PA

LEAPIN' LAWYERS



Just great, another buck goes down the "black hole of American society"—the legal profession ["The end of firing at will," October]. I'm sure that the lawyers are jumping for joy, because after the smoke clears, they get most of the settlement anyway. It's too bad that

you didn't include some input from the plaintiffs to find out how much they really took home.

John Irvine
Omaha, NE

MARKETING MISSED

Your "President's Issue" was a timely and interesting overview of current activities in the use of information resources to improve profitability. Most of the major business functions were addressed, with the notable exception of marketing. The marketing function, which even traditional research- or manufacturing-oriented firms are recognizing as vital to their survival and growth, has been laggard with respect to automation. Today, however, marketing-information and -control systems are being built, albeit fitfully. This area of business may have even greater untapped potential for profitability than some of the others.

Morris Olitsky
Executive Vice President
Robinson Associates Inc.
Bryn Mawr, PA

WE WAS WRONG

It has always struck me as strange that the computer industry has used the words "data" and "media" as singular nouns, when in fact they are plural. Statisticians and other quantitative scientists have long spoken of one datum and more than one data; and each of several media is a medium. Through years of this misuse, we now find some dictionaries acknowledging this unfortunate grammatical state of affairs; but one national magazine has exclaimed in exasperation that "data no longer are, they is."

Therefore, it was interesting to note that in your June issue of *Computer Decisions* even your writers and editors

do not always keep this matter straight. On page 170 the word "data" is used as both plural and singular in the same sentence: "Once the data has . . . been fried, they are unretrievable." I like to think that correct adherence to grammar over the years would have avoided such an absurdity.

Jerrold H. Zar
Associate Provost for Graduate Studies and Research and Dean of the Graduate School
Northern Illinois University
DeKalb, IL

A LITTLE BIT OFF

"Office Automation" (September) contains the following quotation from *The IBM PC Guide*, by James Kelley:

"We need just 10 of the 255 characters in IBM's extended set. Thus, we ought to be able to pack some 25.5 times more numeric information into a byte than is permitted by the ASCII coding scheme. That seems reasonable, doesn't it?"

Not really. A byte has 256 (not 255) possible values and contains 8 bits of information. A decimal digit has 10 possible values and contains approximately 3.32 bits of information. This figure is computed as the base 2 logarithm of 10, but even without resort to logarithms, it is apparent that a decimal digit must contain more information than the 3 bits in an octal digit and less than the 4 bits in a hexadecimal digit. Thus the ratio of the information in a byte to the information in a decimal digit must fall somewhere between 8/4 and 8/3. The exact ratio is the base 10 logarithm of 256, about 2.408.

Garth Peterson
Sioux Falls, SD

Address letters to the editor to *Computer Decisions*, 10 Mulholland Dr., Hasbrouck Heights, NJ 07604.

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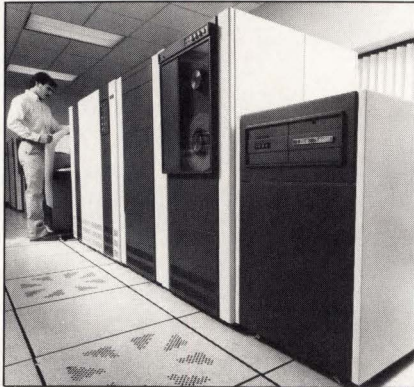


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PRODUCTS / SYSTEMS

MID-RANGE MINIS

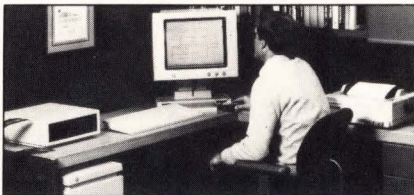


Two mid-range cpu systems have been added to the Prime 50 series of 32-bit superminis. Prices: \$146,500 for the 2-Mbyte Model 9650, and \$251,500 for the 4-Mbyte Model 9750. Both prices include two 315-Mbyte fixed-media disks and a streaming-tape subsystem. Both systems support up to 255 interactive processes simultaneously. Model 9650 supports up to 96 terminals and Model 9750 up to 128.

Prime Computer Inc., Prime Park, Natick, MA 01760.
(617) 655-8000.

Circle 209

SYMBOLIC PROCESSING



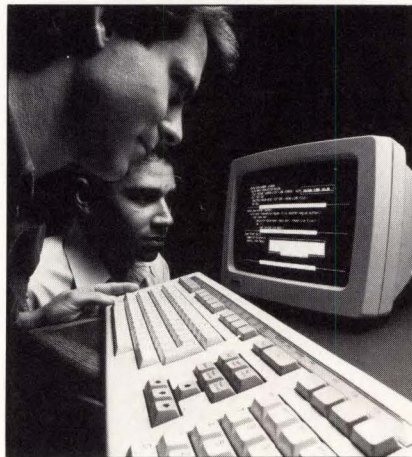
The Explorer System, an advanced symbolic-processing computer designed for artificial intelligence-based applications, has a high-performance symbolic processor optimized for Lisp. Entry-level price: \$52,500. The design features a large control store, tagged

architecture for run-time data typing, hardware-assisted memory management, and 128-Mbyte virtual-address space. The system uses 32-bit high-speed NuBus architecture, 140-Mbyte Winchester-disk drives, and 60-Mbyte cartridge tapes, and supports Ethernet's local-area network.

Texas Instruments, P.O. Box 809063, Dallas, TX 75380-9063.
(214) 995-6611.

Circle 210

ENHANCED DEC SYSTEMS



Version 4.0 of the VAX/VMS operating system provides more access to more data by more users from more systems. It has extended features for VAX clusters, new utilities, and new associated languages. License price is \$10,000. The Ethernet Terminal Server is a network terminal switch that enables up to 32 terminals to be connected to the Ethernet local-area network. Price: \$14,500 to \$20,500, including software. LAT-11 software enables a PDP-11 to be used as a terminal server. Price: \$3,000. MicroVMS is the VAX/VMS operating system for the MicroVAX I microcomputer. It allows programs to migrate from the VAX to the micros and enables applications developed on the

micro to be run on the larger VAX. It's available in kit beginning at \$500. VAX Lisp is an artificial-intelligence product for VAX that can be used to manipulate symbolic as well as numerical data (see photo). The programs it develops can simulate human behavior and thought. Price \$8,000. Other VAX 4.0 products are an enhanced Fortran, DECnet networking software, and a GKS package.

Digital Equipment Corp., Maynard, MA 01754.

(617) 897-5111.

Circle 211

ENTRY-LEVEL SUPERS

The AS/91X0 series of IBM mainframe-compatible supercomputers can handle vector-processing applications and perform 28 million floating-point operations per second. Prices range from about \$2.1 million to \$5 million. AS/91X0 includes a software tool that looks for operations it can vectorize and then inserts code to activate the vector-processing hardware. Upgrades are available for the AS/90X0 series.

National Advanced Systems, 800 E. Middlefield Rd., Mountain View, CA 94042.

(415) 962-6336.

Circle 212

IBM SERIES/1 PROCESSORS

Two new IBM Series/1 processors—the 4956 model E and the 4956 model 60/E, the integrated-disk version—offer about 50 percent greater performance and twice the main storage of the current model. Model E, with 512 Kbytes storage, costs \$16,500; Model 60/E, with 512 Kbytes storage, costs \$27,600.

IBM (Contact your local sales office.)

Circle 247



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Entry blank and rules will appear in the February 26, 1985 issue.

Win a luxurious Princess Caribbean Cruise for two. This ideal getaway on an elegant liner is the vacation of a lifetime! You'll be treated to extravagant meals, splendid entertainment, exciting nightlife, and plenty of fun in the sun. You'll cruise to the exotic Caribbean islands, experience their rich cultures, lounge on their beautiful beaches. Sample the perfect blend of comfort, elegance, and adventure on this dream cruise.

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2. Read the rules contained in the issue.
3. Pick the 10 advertisements you think your fellow readers will best remember having seen.
4. List the ads by Company Name, Reader Service Number and Page Number on the entry card.

MAIL BEFORE APRIL 15, 1985.

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A parallel contest with the same top prizes for advertisers, advertising agencies, and advertising personnel companies. You too can win a luxurious Princess Caribbean Cruise or other prizes. The Top Ten Contest issue is one of the year's biggest advertising opportunities, with extra readership for every ad.



PRODUCTS / SOFTWARE

IFPS/STAT INTERFACE

IFPS/STAT Interface links IFPS decision-support software with SAS statistical software running on IBM CMS and TSO mainframes. Priced at \$6,500, it is compatible with IFPS Releases 9.0 and 10.0 and SAS Version 82.4.

Execucom Systems Corp., 3410 Far West Blvd., Austin, TX 78731.
(512) 346-4980. **Circle 213**

APTOOLS FOR DEC VAX/VMS

APTools, an applications-development system for the DEC VAX under VMS, features version and configuration control, dependencies management, access control, an interface with VMS utilities and facilities, automated-documentation and software-installation procedures, and reduced software-maintenance activity. Price ranges from \$20,000 to \$50,000, depending on VAX equipment. APT-Auto, a subset of APTools, relieves programmers of repetitive, low-complexity programming tasks and is also a tool for prototyping and testing.

Mitchell Management Systems, Westborough Office Park, 2000 W. Park Dr., Westborough, MA 01581.
(617) 366-0800. **Circle 214**

CMS/MVS BRIDGE

CMS-MVS Communication Facility (CMC), available for use with VM/SP Release 3, makes it possible to invert CMC to allow communication between CMS and MVS. Price: \$5,300 or \$240 per month for a cpu license. CMS Multi-Volume Support Tape Facility, available for use with VM/SP

Releases 2 and 3, is fully compatible with standard CMS tape support and allows up to 20 volumes to be defined to comprise a single tape file. Price: \$4,000 or \$180 per month for a cpu license. Tapes use standard labels and are accessed using standard OS simulation facilities in CMS.

Adesse Corp., P.O. Box 607, Ridgefield, CT 06877.
(203) 431-3071. **Circle 215**

DEC VAX NETWORKING

The DMG/NET networking package for VAX computers provides communication via direct links, leased lines, or X.25 PAD to packet-switched networks and includes a file-transfer facility. A license for direct network connections is \$2,000. Optional auto-dial support is \$500 and X.25 support is \$1,500. No special interfaces are needed; a standard DEC terminal port is used for outgoing messages.

Digital Management Group Ltd., 4800 Yonge St., Willowdale, Ontario, Canada M2N 6G5.
(416) 225-7788. **Circle 216**

BIM WINDOWS

Bimwindow provides windowing capabilities for users of IBM mainframes with VTAM and permits 3270 terminals to switch back and forth instantly between multiple VTAM-application sessions. Price: \$2,400 for permanent license, \$1,200 per year, or \$120 per month for DOS/VSE; \$3,600, \$1,800, and \$180, respectively, for OS. A 3270 terminal may have up to four active concurrent sessions. A defined key allows switching between sessions. Bim-Edit release 2.0, an upgrade of the program-editor system for DOS/VSE CICS users, in-

cludes program checkout/check in, auditing, and library scan. Price: \$4,000 for permanent license, \$2,000 per year, or \$200 per month.

B.I. Moyle Associates, 5788 Lincoln Dr., Minneapolis, MN 55436.
(612) 933-2885. **Circle 217**

COBOL TESTING TOOL

With Release 1.1.0 of XPF/Cobol, programmers can monitor and debug programs 10 times faster than with the previous release. Perpetual license fee is \$30,000 for the first central-processing unit. With the IBM VS Cobol II-compatible compiler, debugging activities are recorded for review. Programmers can change the value of an individual item.

Boole & Babbage Inc., 510 Oakmead Pkwy., Sunnyvale, CA 94086.
(408) 735-9550. **Circle 218**

MAPICS ENHANCEMENT

Bedford Data Mapics Enhancement allows IBM System/38 users to simultaneously create and operate up to 50 independent databases that function separately but share IBM's Mapics software. Price: \$2,500. Keyword commands can be executed without exiting Mapics.

Bedford Data Systems, 19 Harvey Rd., Bedford, NH 03102.
(603) 627-1630. **Circle 219**

DATA MANAGER FOR DEC VAX

The Intouch information-management system for DEC VAX minicomputers can be used with VAX RMS, VAX

PRODUCTS / SOFTWARE

DBMS, and VAX RDB, as well as with user-defined record-management systems. Price is \$4,500 for Micro VAX; \$7,900 for VAX 11/725 and 11/730; \$14,900 for 11/750; and \$25,900 for 11/780. The package features dialog mode.

Touch Technologies Inc., 609 S. Escondido Blvd., Escondido, CA 92025.

(619) 743-0494.

Circle 220

VAX WORD PROCESSORS

WPS-Plus/VMS features full-function word and document processing and is DECmate compatible. It costs \$6,000 and runs on VAX 11/730, 11/750, 11/780, 11/785, and VAXcluster

systems. MASS-11 has special word-processing features for technical, legal, and financial applications. It costs \$9,000 and runs on VAX models 11/730 and up.

Digital Equipment Corp., Maynard, MA 01754.

(617) 897-5111.

Circle 221

PERFORMANCE MONITOR

Explore/VM, an interactive VM-performance monitor for IBM mainframes and plug compatibles, provides both real-time and batch facilities. Price: \$5,600 for a permanent license or \$140 per month for a three-year renewable license. Key features include exception reporting, degradation analysis, long-term archiving, plotting

options, and flashback.

Goal Systems International, 5455 N. High St., Columbus, OH 43214-1193. (614) 888-1775.

Circle 222

IMS DATABASE ACCESS

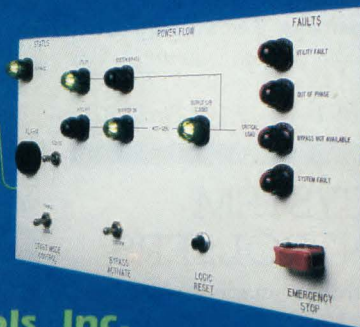
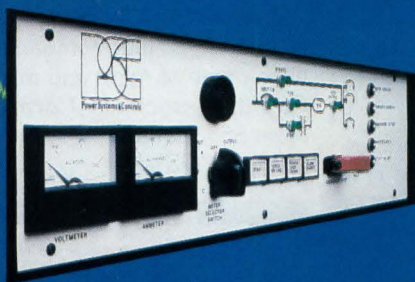
DLI/Online release 1.0, a full-screen, interactive productivity aid designed for users of IBM's Information Management System, allows programmers to access an IMS database, view its contents and structure, and create, fix, modify, add, and delete information online. Priced at \$5,900, DLI/Online supports IMS/DLI commands.

DBMS, 1801 Mill St., Naperville, IL 60540.

(312) 961-5700.

Circle 223

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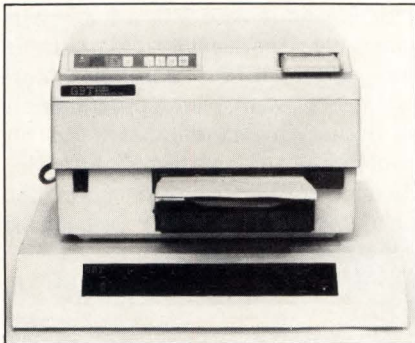
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PRODUCTS / PERIPHERALS

DESK-TOP LASER PRINTER

The GBT 6630XP desk-top laser printer, priced at \$5,995, operates with IBM Systems/34, /36, /38 and PC, prints at 480 characters per second, and has a standard twin-coaxial-cable interface. For remote applica-



tions, the printer connects to the system through an IBM 5251-12 or 5294 display station. The model features two typesets and horizontal or vertical printing, and accommodates standard- and legal-size paper, as well as labels and transparencies.

General Business Technology Inc., 1891 McGaw Ave., Irvine, CA 92714.

(714) 261-1891.

Circle 201

SYSTEM CONTROLLERS

System-controller models 410 and 420 offer up to 32 asynchronous ports and a 3270 interface. Price: \$14,820 for Model 410; \$19,520 for Model 420. Model 410 allows communications through DEC VT52, VT100, VT132, and HP 2624 point-to-point emulations. Model 420 provides local access to IBM or compatible hosts. The Quicklink adapter allows IBM 3270 display terminals and controllers to be connected by twisted-pair cables. Price: \$98 per connector pair.



Quicklink supports connections up to 1,000 feet and interfaces with standard Bell RJ11C jacks. Series 25 voice/data workstations provide advanced telephone functions for IBM 3270 or compatible terminals. Price: \$1,295 to \$1,895. Features include auto-dial, personal directory, and user-programmable telephone keys.

Lee Data Corp., 7075 Flying Cloud Dr., Minneapolis, MN 55344.

(612) 828-0300.

Circle 202

COMPACT TERMINALS

Triumph! is a line of multi-protocol terminals that contain two or more resident emulating modes for multi-host or



single-host applications. Priced at \$1,395 to \$1,695, the terminals occupy only 10-by-10 inches of desk space, but have a 14-inch crt screen. Model 20-DDG is compatible with the DEC VT220 and the Data General D210. Model 7-DHP is compatible with the Hewlett-Packard 2622/2624 and the DEC VT102. Model 7-DBM is compatible with the IBM 3101 and the DEC VT102. Model 7-7305 is compatible with the Honeywell VIP7305 and the DEC VT102. All models have optional Tektronix 4010/4014-compatible graphics.

Teleray, Box 24064, Minneapolis, MN 55424.

(612) 941-3300.

Circle 203

LONG-LIFE BAND PRINTER

The L-800 band-printer system provides high-quality print and eliminates character clipping. Prices range from \$7,100 to \$9,500. A long-life cartridge ribbon and modular construction minimize downtime for the printer, which is plug-compatible with a wide range of minis and mainframes.

Digital Associates Corp., 1039 E. Main St., Stamford, CT 06902.

(203) 327-9210.

Circle 204

SPEECH GENERATOR

The Calltext 5050 converts ASCII text to speech and transmits it over phone lines. Price: \$2,975. The voice peripheral can be used in interactive systems with local or remote users. The phone interface detects and generates signals and provides controls for answering and initiating calls. Expansion cards that permit the 5050 to support up to three simultaneous conversations cost \$2,700 each. A

PRODUCTS / PERIPHERALS

Touch-Tone phone is needed to interact with a Calltext 5050-equipped computer.

Speech Plus Inc., 461 N. Bernardo Ave., Mountain View, CA 94043.
(415) 964-7023. **Circle 205**

DEC DATA STORAGE

Aquarius II is a large-capacity data-storage system for DEC VAX and large PDP-11 systems. Prices range from \$29,990 to \$51,450. The basic system includes a 474-Mbyte Winchester-disk drive and a 180-Mbyte cache-tape drive.

First Computer Corp., 645 Blackhawk Drive, Westmont, IL 60559.
(312) 920-1050. **Circle 206**

TANDEM WORKSTATIONS

Tandem's Dynamite 654X workstations have the features of its 653X online terminals, including optional IBM 3270 emulation and the process-



ing power of a stand-alone personal computer. Price: \$2,995 for Model 6541; \$3,995 for Model 6546. Each model comes with 256 Kbytes of

RAM, a dual-mode 12-inch display, MS-DOS, and GW-Basic. Model 6541 includes two 360-Kbyte floppy-disk drives. Model 6546 includes one 360-Kbyte floppy drive and one 10-Mbyte Winchester-disk drive. Main memory can be expanded to 640 Kbytes in each unit.

Tandem Computers Inc., 19333 Vallco Pkwy., Cupertino, CA 95014.
(408) 725-6000. **Circle 207**

Shared-file access under dBase II:

The dLock file-locking system for CP/M-80 coordinates multiple users' access to dBase II data files. The system, made by Com-Pro (Charleston, SC), can also poll the keyboard to test for the presence or absence of a key stroke.

Circle 208

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Company _____ Phone _____

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Mail to: **ILAR Systems, Inc.** • 1300 Dove St., Suite 200 • Newport Beach, CA 92660

CIRCLE 70

PRODUCTS / MICROS PLUS

MESSAGE CENTER

Comm Center IIX combines an intelligent modem with a processor-controlled message center. Price: \$1,095. The package, which permits uploading and downloading of files on the IBM PC via programmed diskette, has a resident editor, DDD- and Telex-line interfaces from major record carriers, 16 Kbytes to 32 Kbytes of memory, and an internal 103 modem for phone connection to message services, host computers, or timesharing networks.

Henriksen Data Systems Inc., 12325 W. 52nd Ave., Wheat Ridge, CO 80033.
(303) 425-9303. **Circle 226**

MENU SYSTEM BYPASSES DOS

Magic Menu, a two-program package for the IBM PC and compatibles, allows users to bypass DOS commands when selecting and executing over 1,000 applications. Price: \$99. Magic Menu, which runs under DOS releases 2.0 and later, features a memory-resident menu that avails the disk drive for other applications as soon as program and menu definitions are loaded. Other features include password protection, automatic-entry processing, automatic blanking after a designated period of inactivity, and hard-copy capability. Users can define variables to customize menus.

Deeresoft Inc., P.O. Box 1360, Melbourne, FL 32901.
(305) 768-2477. **Circle 227**

WP PACK FOR PC-DOS

Lex Word Processing Software for systems running under Bell Labs' Unix

is now available for the IBM PC under PC-DOS. All versions work with the same menu-driven interface and editing commands and no user retraining is required.

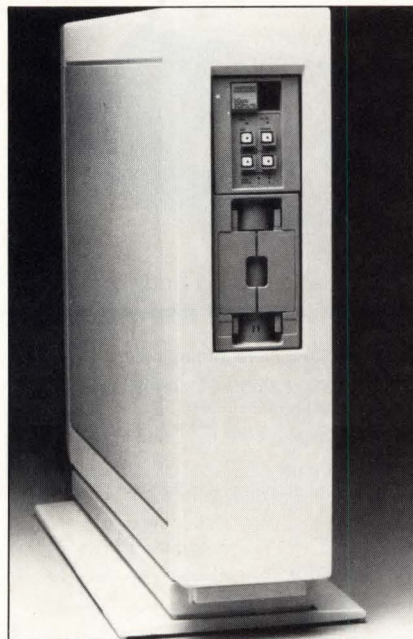
Softest Inc., 555 Goffle Road, Ridgewood, NJ 07450.
(201) 447-3901. **Circle 228**

PC-BASED CAD SYSTEM

Cadvantage, an office-design and space-planning CAD package for the IBM PC XT, develops equipment specifications, generates orders, creates elevation and plan drawings, and performs inventory-management routines. Price is about \$20,000.

Haworth, One Haworth Center, Holland, MI 49423.
(616) 392-5961. **Circle 229**

HIGH-END DEC



MicroPDP-11/73 offers performance like that of a mid-range mini, supports 10 different operating systems, and is suitable for process control, communications, and many other real-time and multi-user tasks. Prices range from \$7,800 for a rack-mount system to \$19,040 for a package that includes two disk drives, 31-Mbyte hard disk, and streaming-tape-cassette drive.

Digital Equipment Corp., Maynard, MA 01754.
(617) 897-5111. **Circle 230**

JOB-COST PROGRAM

Mica job-cost applications software lets users define up to 999 components per job, estimating and monitoring costs for each. Price: \$995. The program also forecasts final costs and handles online inquiries. It runs on the IBM PC and compatibles under PC-DOS and MS-DOS, as well as HP 150, AT&T, TI, Victor, and Docutel-Olivetti systems.

Micro Associates Inc., 2349 Memorial Blvd., Port Arthur, TX 77640.
(409) 983-2051. **Circle 231**

PURCHASING SYSTEM

P.O. Writer is a complete purchasing system for the IBM PC XT. Module I, which costs \$1,995, prints, stores, and retrieves purchase orders and provides summary reports. Module II, priced at \$3,000, handles receiving, displays the status of open purchase orders, and calculates vendor performance. It accommodates up to 15,000 items and 5,000 vendors, as well as multiple delivery dates.

American Tech Inc., 8805 Parkway, Grosse Ile, MI 48183.
(313) 671-8380. **Circle 232**

PRODUCTS / MICROS PLUS

COLOR GRAPHICS



A Video Display Adapter (\$500), an Image Capture Board (\$1,000), and a Personal Computer NAPLPS Decoder (\$600) enable AT&T, IBM, and compatible personal computers to display continuous-tone, TV-quality images on color TVs or monitors.

AT&T Consumer Products, 5 Wood Hollow Rd., Parsippany, NJ 07054.
(201) 581-3000. **Circle 248**

MAINFRAME LINKS

Infotlink and Auditlink provide micro-to-mainframe links for the IBM mainframe and plug-compatible OS and VM environments. Infotlink, which includes CQS-Infotec, a report writer and information-retrieval package for dp professionals, costs \$48,000 for the VM/CMS version and \$53,000 for the OS version. Auditlink, which includes CQS-Auditec, a report writer and information-retrieval package for EDP auditors, is priced at \$43,500 for the OS version and \$42,500 for the VM/CMS version. With both products, users can access and report on data from any standard file. Information can be downloaded to personal-computer spreadsheets, graphics, and

database management packages. A menu-driven online option, which provides interactive syntax-checking and dictionary maintenance, allows users to run in the interactive environment under TSO and CMS.

Carleton Corp., 245 First St., Cambridge, MA 02142.
(617) 494-1232. **Circle 249**

PERSONAL COMPUTERS

The Touchscreen Personal Computer and the Touchscreen MAX replace Hewlett-Packard's Model 150 personal computer. The computers include double-sided 3½-inch drives with 710 Kbytes per disk—more than twice the capacity of conventional single-sided disks. Price: \$3,495 for the Touchscreen Personal Computer flexible-disk system, and \$5,495 for the Touchscreen MAX, a 15-Mbyte hard-disk system. Etherseries/150 networking products provide communications between HP and IBM PC users. As many as 50 networked IBM PCs and Touchscreen Computers can share peripherals, such as HP's Laserjet printer.

Hewlett-Packard (Contact your local sales office.) **Circle 250**

MICRO-PACKAGE VERSION

A mainframe and mini package, ABC/MM Maintenance Management System, now runs on the IBM PC XT. Price: between \$4,000 and \$10,000, depending on the number of modules selected. It offers the Cobol system that runs on the IBM 3083 and 4300 mainframes, DEC VAX and PDP 11, HP-3000, and Honeywell minis. Upgrading to larger minis and mainframes is possible. ABC/MM is menu-

driven and online and combines a common database and eight integrated-program modules, which are available separately.

ABC Management Systems, 805 Dupont St., Bellingham, WA 98225.
(206) 671-5170. **Circle 251**

MS-DOS SPREADSHEET

PFS:Plan, an electronic spreadsheet running on MS-DOS personal computers with 128-K memory, features keywords that perform calculations and quick-entry keys that allow users to generate row and column headings with one keystroke. Priced at \$140, PFS:Plan works independently of or can be used with PFS software.

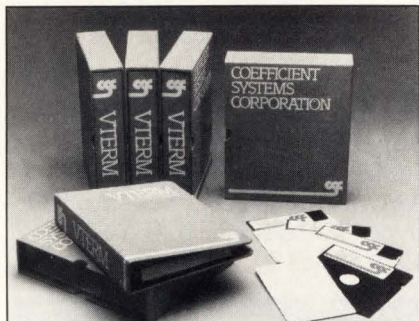
Software Publishing Corp., 1901 Landings Dr., Mountain View, CA 94043.
(415) 962-8910. **Circle 252**

APPLICATION PACKS

Release 1.6 of the Infostar? database management system features a data-dictionary utility, a prompting-menu interface, and the ability to restructure an existing database automatically. Price: \$595. Update prices for earlier versions are \$100 to \$300. Prosolutions are customized applications for automating specific information-management tasks with Infostar? 1.6 under PC-DOS and MS-DOS. Price: \$99 each. Two such applications are Prospect Tracking, which organizes and reports on customer sales contacts, and Mailing List and Business Letters, for volume-mailing projects.

Micropro International Corp., 33 San Pablo Ave., San Rafael, CA 94903.
(415) 499-1200. **Circle 253**

DEC EMULATOR



VTERM II allows an IBM PC to emulate DEC VT100, VT102, and VT52 terminals. Price: \$160. Features include error-correcting binary-file transfer, 20 user-definable function keys, and a toggle that lets users switch between DOS and VTERM II. An upgrade for VTERM I is \$75. UltraPAK, an optional hardware/software package for 132-column display, is \$680 and includes VTERM II.

Coefficient Systems Corp., 611 Broadway, New York, NY 10012.
(212) 777-6707. **Circle 233**

PC-COMPATIBLE SANYO

The Sanyo MBC 775, a 16-bit, IBM PC-compatible portable computer, features a built-in, 9-inch color monitor, two 360-Kbyte disk drives, and a detachable keyboard. The system, priced at \$2,599, comes with 256 Kbytes of memory expandable to 640 Kbytes, and runs under MS-DOS 2.11. Two expansion slots will accept PC-compatible boards.

Sanyo Business Systems Corp., 51 Joseph St., Moonachie, NJ 07074.
(201) 440-9300. **Circle 234**

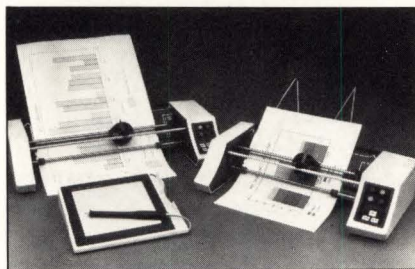
FREE-FORM PAINTING

PC Paintbrush, a 16-color painting program for the IBM PC, PCjr, and compatibles, offers five pull-down menus, 14 drawing tools, and 34 back-

ground patterns. Priced at \$150, the program runs on seven popular color boards and can be implemented with a mouse or joystick. Six fonts are available in seven styles and sizes.

International Microcomputer Software Inc., 633 Fifth Ave., San Rafael, CA 94901.
(415) 454-7101. **Circle 235**

PLOTTER AND DIGITIZER



The four-pen PC Plotter offers a pen speed of 4.2 inches per second and resolution of .004 inches and works with any computer with RS-232C interface. Model 595, for 8½-by-11-inch graphics, costs \$595. Model 695, which also accommodates 11-by-17-inch graphics, is \$695. An 8-by-7-inch PC Pad can be used as a digitizer and as a mouse with appropriate software for any computer with an RS-232C port. Price: \$395.

Houston Instrument, 8500 Cameron Rd., Austin, TX 78753.
(512) 835-0900. **Circle 236**

DATA MANAGEMENT

Please is a menu-driven data-management system for the IBM PC and compatibles. Price: \$349. Users can create a database easily and can restructure, merge, or transfer data in seconds. Please manipulates up to 999 characters per field, 99 fields per record, 2,000 characters per record, and several million records per database. Optional application templates with preset data structures are \$30. Smartcom I software, bundled with Smartmodem

300, is a complete communications package for the Apple IIc. Price: \$339. The package features an easy-to-use menu, a choice of three file-transfer protocols, Bell 103 compatibility, and auto-answer and auto-dial. The program handles data files formatted by ProDOS, DOS 3.3, CP/M, and Pascal.

Hayes Microcomputer Products Inc., 5923 Peachtree Industrial Blvd., Norcross, GA 30092.
(404) 449-8791. **Circle 237**

SCSI STORAGE

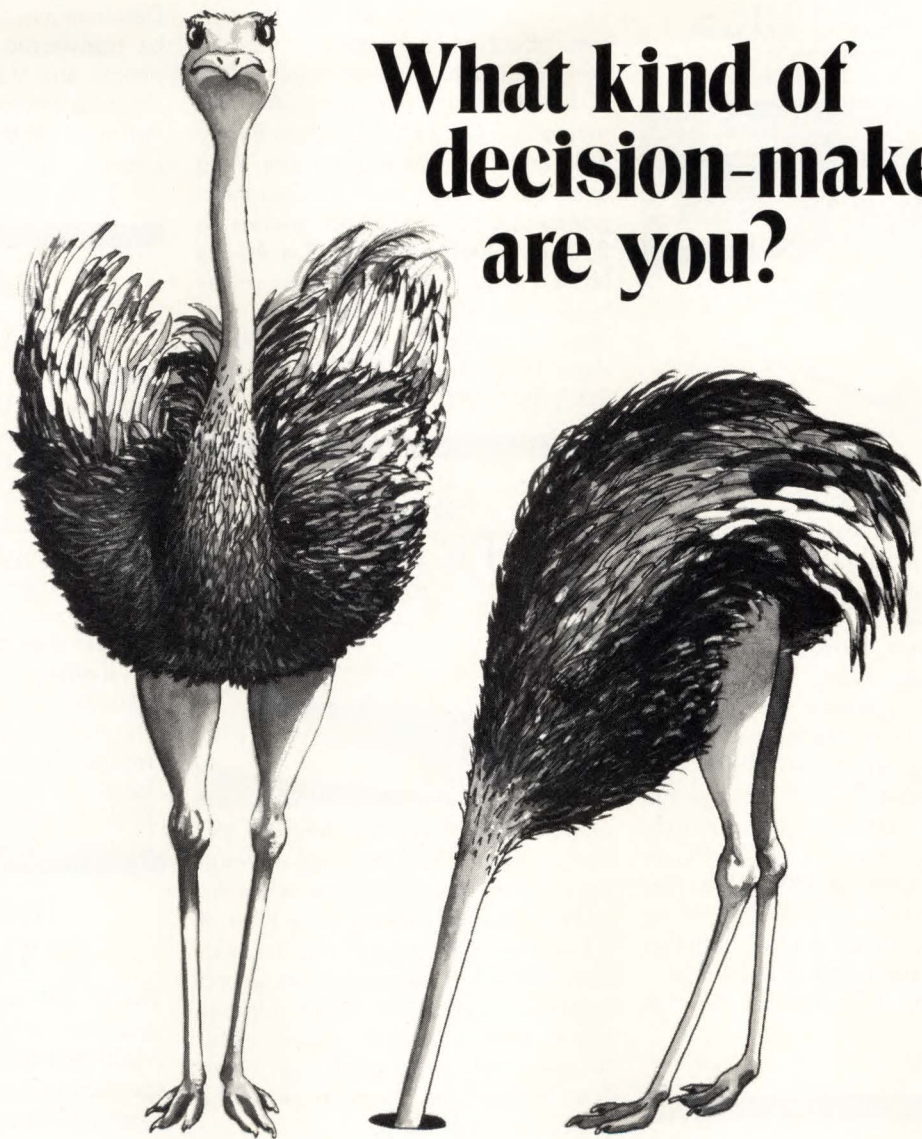
The IBO1 IBM Host Adapter brings Small Computer Systems Interface (SCSI)-based high-capacity storage to the IBM PC and compatibles. Price: \$345 to \$395. A variety of SCSI-based disk or tape drives can be attached to the PC with no modification of the operating-system software. Hard-disk memory capacity can be expanded to 1 gigabyte or more in a single system. On-board memory is 6 Kbytes of ROM and 2 Kbytes of RAM.

Emulex Corp., 3545 Harbor Blvd., Costa Mesa, CA 92626.
(714) 662-5600. **Circle 238**

FORECASTING SYSTEM

Horizon/370, a turnkey forecasting system based on the IBM PC XT/370, provides users with 30 Mbytes of storage and up to 4 Mbytes of virtual memory. Price: \$50,000. It estimates, evaluates, and validates statistical models, creates custom reports and graphics, designs routines to automate repetitive tasks, and offers such state-of-the-art forecasting techniques as regression analysis and time-series analysis. Horizon/370 has over 50 functions for data analysis and transformation.

Chase Decision Systems, 1000 Massachusetts Ave., Cambridge, MA 02138.
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PC-GRAPHICS SYSTEM



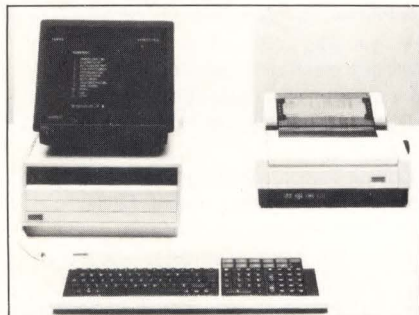
Series 2900/3900 professional color workstations support IBM 3270 emulation and asynchronous communications, offer the IBM PC as a dedicated or shared resource, and feature seven color graphics. The 2900 series, priced between \$5,600 and \$5,700, runs on coaxial cable. The 3900 series, priced between \$5,915 and \$6,015, runs on twisted-pair wires. With a file-server option (\$995), the system defines a PC with disk storage as the user's database while it searches the network for an available PC. A file-transfer option (\$800) allows files to be transferred from PC to PC or from PC to mainframe. Thirty-two users can share as many as 24 PCs.

Davox Corp., 4 Federal St., Billerica, MA 01821.

(617) 667-4455.

Circle 240

NEW NIXDORF MICRO



The Micro 7, the newest of the Nixdorf 8870 business computers, offers complete software and peripheral compatibility with the other members of the

8870 line. Priced at \$6,995, the system offers word-processing, calculation, administration, and organizational functions and features 256-Kbyte memory, a 5¼-inch 800-Kbyte floppy disk, and a 10-Mbyte fixed disk. Also available are 100- and 150-character-per-second (cps) compact printers, a 210-cps inkjet printer, and a 40-cps letter-quality printer. Printer prices range from \$3,500 to \$5,000.

Nixdorf Computer Corp., 300 Third Ave., Waltham, MA 02154.

(617) 890-3600.

Circle 241

QUIET PRINTER



Quietwriter Printer for the IBM PC and many non-IBM personal computers employs resistive-ribbon technology to achieve a printing noise level of 53 decibels. The price for the unidirectional 40- to 60-character-per-second printer is \$1,395. The ribbon releases ink as it pinpoints heat generated by 40 electrodes in the printhead. There is no impact from the printhead to the paper during printing.

IBM (Contact your local sales office.)

Circle 242

PC PROJECT MANAGER

Total Project Manager (HTPM), a project- and resource-management package that runs on the IBM PC, PC XT, PC AT, and compatibles under PC-DOS Release 2.0, employs critical-path-method planning techniques and uses Gantt, program-evaluation, and review-technique charts for enhanced visual emphasis. Price: \$495. Managers can create "what-if" scenarios for situations such as equipment failures.

Data contained in HTPM projects can be transferred to Lotus 1-2-3, Symphony, and Visicalc files. HTPM also supports Microsoft's mouse.

Harvard Software, 521 Great Rd., Littleton, MA 01460.

(617) 486-8431.

Circle 243

MICRO DATABASES

Hayden Book Co. has published *The Information Online Toolkit*, designed to make accessing public databases, such as Dialog, Compuserve, Newsnet, and others more efficient and inexpensive. Price: \$29.95. The package combines *The Microcomputer User's Guide to Information Online*; SuperScout, a communications-software disk for the IBM PC and PC XT, developed by Business Computer Network, and an operator's manual, a reference guide to the BCN system.

Hayden Book Co., 10 Mulholland Dr., Hasbrouck Heights, NJ 07604

(201) 393-6306.

Circle 244

IBM 5520 INTERFACE

The Io 903 interface converts bisynchronous ASCII to asynchronous ASCII and links the IBM 5520 Management Information System with any personal computer or asynchronous communication device. Price: \$5,495. The interface handles code conversions and formatting and adds line security. Computers can be connected from any location via dial-up asynchronous modem.

Io Corp., 1343 Blalock, Houston, TX 77055.

(713) 465-4901.

Circle 245

Card systems for HP 3000: The CR300-30 tabletop unit from Cardam (Frazer, PA) reads 300 cards a minute for the HP 3000. The RP8230 punches and prints up to 75 cards a minute and reads 200 cards a minute for the same machine. It can also be used offline.

Circle 246

Man Bytes Dog



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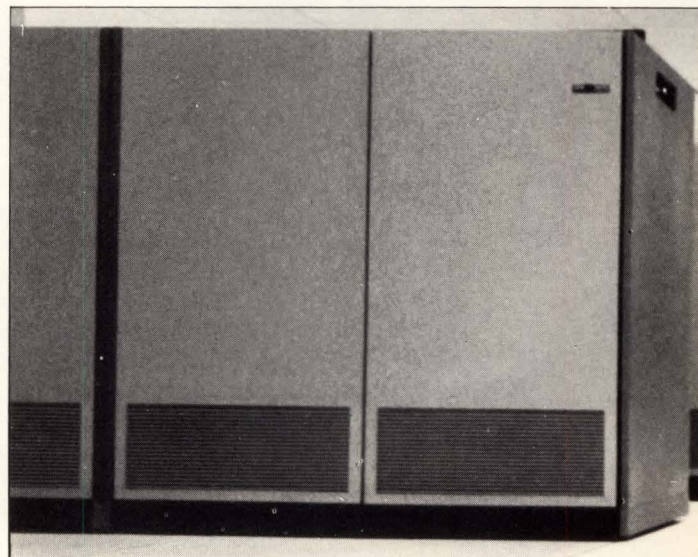
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YOUR CAREER

by Mary Miles, New England Editor



By presenting the sole of his shoe to his Mideastern hosts, this manager is committing a serious gaffe.

BUSINESS ETIQUETTE ABROAD

Carleton Codger is about to make several social gaffes that may cost his company dearly. He is meeting in Tokyo with several Japanese businessmen, and the negotiations he is about to undertake are key to his organization's efforts to expand into international markets. He's made reservations at a fine Japanese restaurant—that's a good first step. When his Eastern counterparts arrive, however, he gets off on the wrong foot by declining to remove his shoes before sitting at the low table. Laughing, he lights his cigar and heartily slaps Kobo Okada on the back, booming, "You fel-las can have your raw squid. I'll take a steak any day!" He winks at the kimono-clad server and orders beer for all. As soon as everyone is seated, he passes out copies of his company's annual report.

Within the first 10 minutes of what will be several days of meetings, Carleton has disturbed and offended his guests. He could have avoided some of his mistakes if he had bothered

to learn more about Japanese social customs. For instance, he would have discovered that they (like many other non-Americans) prefer a slower approach to business dealings, and that physical contact and familiarity with strangers may be considered unpleasant.

The example of Carleton Codger is extreme, but it highlights an important fact for managers: With global business travel increasing, closer attention to cultural differences is essential.

"Sadly, Americans are much less sensitive to cultural differences than their foreign counterparts. This is a business disadvantage," says Kathy Keehn, administrator of Hewlett-Packard's foreign-service employee program. Keehn is currently developing international-relocation policies. "It's not enough to know another language," she adds. "Learning the etiquette is equally important."

Henry Duques, the Boston-based regional director of Inlingua, a language school with 200 branches throughout

the world, says that one of the most serious etiquette errors American managers make is being too friendly too soon. "With many foreign contacts, you must almost be given permission to use first names," he observes. "Some cultures find Americans aggressive and condescending, with the attitude of 'We have the power, the know-how, and the money—and you are minor league.'"

San Francisco-based consultants Lennie Copeland and Lewis Griggs take a different approach. Their four-part film, *Going International*, shows employees how to cope with varying cultural attitudes, whether they are relocating to a branch office in another country or dealing only occasionally with foreign contacts abroad or in the United States. (See photo.)

"The business arena has changed significantly," says Copeland. "More American corporations are realizing that to stay competitive, they must respond to the cultural styles of the countries they operate in." Copeland, who

YOUR CAREER

lived abroad for many years, is especially aware of how Americans overseas are perceived. One irksome American characteristic is the tendency to rush. "If we're kept waiting for an appointment, we become terribly impatient and visibly annoyed," she says. "Or, as soon as a meeting begins, we pull out our portfolios and present the deal or the product. Ticking away in our minds is a loud clock that says we have to close the deal immediately. In almost every other country in the world, that's exactly the wrong thing to do."

Lemoine Pierce, a district director for the Berlitz language schools (New York), believes that because American managers lag in their knowledge of other languages and cultures, U.S. business abroad is losing its long-standing competitive edge. "We should

make it our business to do our homework—both linguistically and culturally—before meeting our foreign counterparts," she says.

Most foreign managers appreciate even a fumbling acknowledgement of their customs. "You can make friends and influence people right away by greeting foreign associates in their own language, perhaps apologizing for your lack of fluency," says Chris Allen, sales manager with Suntour USA, a Japanese bike-parts importer based in Fairfield, NJ. However, "unless you are very proficient, stick to English during negotiations," he adds. Many a promising deal has been botched by unintentionally mangled words or phrases that embarrass or offend.

In some instances, an interpreter's services may be in order. But, Chris Allen cautions, "make sure you hire a



Bow or handshake? Does it matter?

very good one, and be prepared for subtleties in the speaker's intended meaning that a literal translation may not convey. The better you know your

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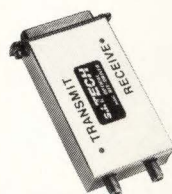
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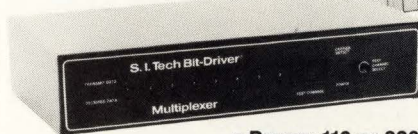
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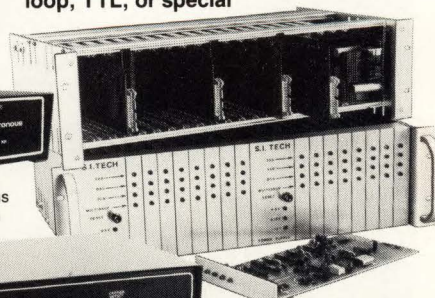
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YOUR CAREER

IN A PINCH

Let's say you're going to Munich on business in three weeks, and you've learned to say "hello," "goodbye," "forgive my poor German," and "thank you very much." But you're in a fog about etiquette do's and don'ts. Don't despair: Call a nearby language center, contact a university (a bilingual teacher or student may be able to fill you in on some of the finer points of decorum), or you can even try the German consulate. Do you have any globe-trotting friends? Tap them for their knowledge of other cultures. Spend a few valuable hours at the local library. Call or write the U.S. State Department—its Foreign Service Institute publishes a booklet called "Social Usage Abroad."

In short, learn something about your host country. Then put on a smile and your best manners: How you behave may make the difference between a rewarding business venture and a dismal washout.

contact and his or her cultural background, the stronger your position."

Although you may be unfamiliar with your counterparts' language, take care not to offend by assuming that they are deficient in English. Says Lennie Copeland, "Part of your job is to discover the extent of your associates' familiarity with English. For example, the person you're dealing with may wear traditional Saudi Arabian dress, but he may have graduated from the Harvard Business School."

The language of gestures can be as important as spoken words when conducting business across cultural lines. "Sharing a language is sharing part of a culture," says Lemoine Pierce. "Gestures are part of the language. In many cultures, the proper gesture at the right time is as important, if not more so, as the correct word. In some countries, for example, you shouldn't put your hands in your pockets. In others, you shouldn't show the soles of your shoes. In Japan, the act of bowing speaks volumes."

This doesn't mean you must learn every gestural nuance as well as struggle with an unfamiliar language. But recognizing the major taboos may save you a red face and a ruined business transaction. Learn what's important to your overseas compatriots. You may not offend by eating your sushi with a fork, but you should be aware that offering alcohol to a Muslim is a far more serious gaffe. Today, shaking hands is a recognized international gesture of friendship, but in some cultures the knowledge of which hand to use, whom you shake hands with, and even where you put your feet may spell the difference between a thriving business relationship and that sinking feeling that something's gone terribly wrong.

Finally, a sincere effort to be sensitive to others' customs will always count in your favor. Organizations can do themselves and their employees a valuable service by preparing them to adapt gracefully to other cultural styles, customs, and manners. It's good business. □

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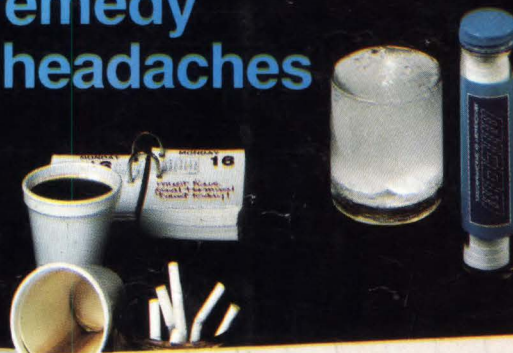
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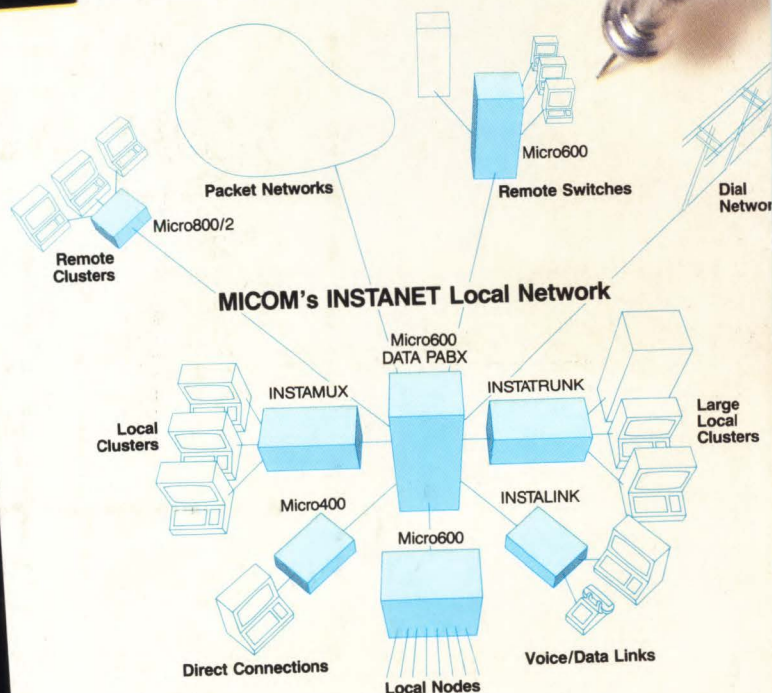
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